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AMERICAN Journal of Public Health

AND THE NATION'S HEALTH

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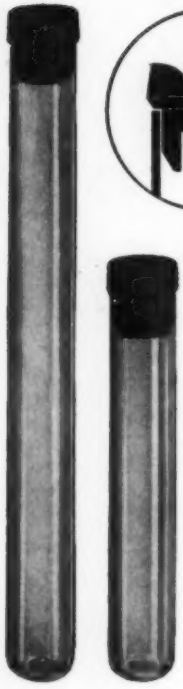

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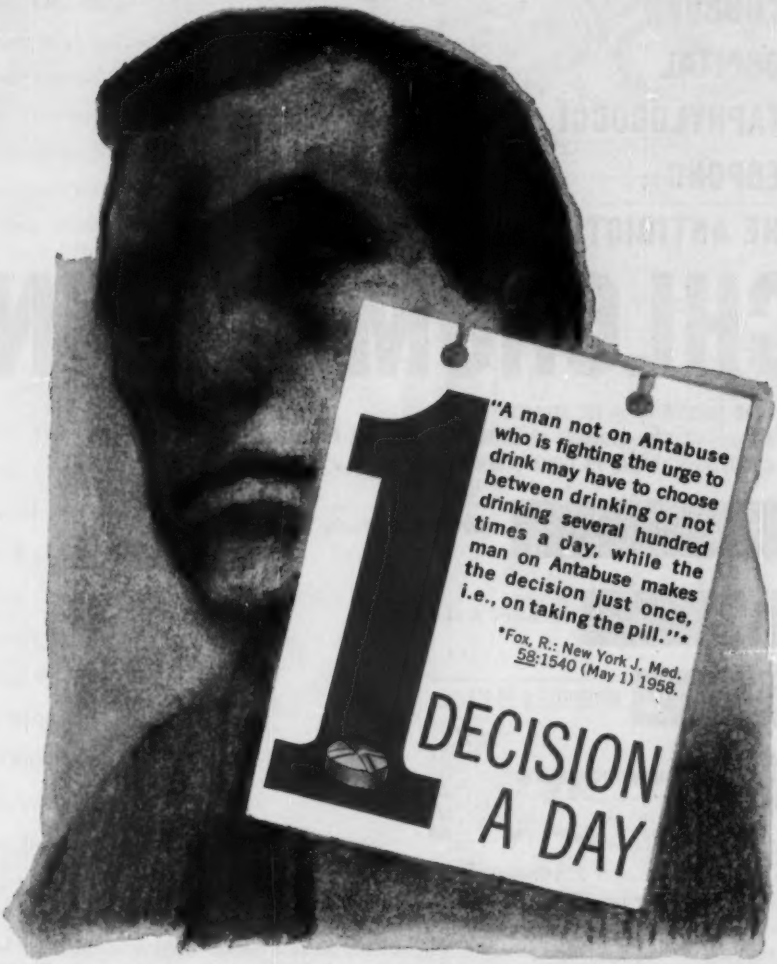
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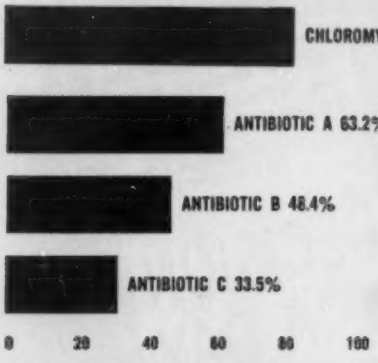

*Adapted from Goslings, W. R. O., & Büchli, K.: *Arch. Int. Med.* 102:691, 1958.

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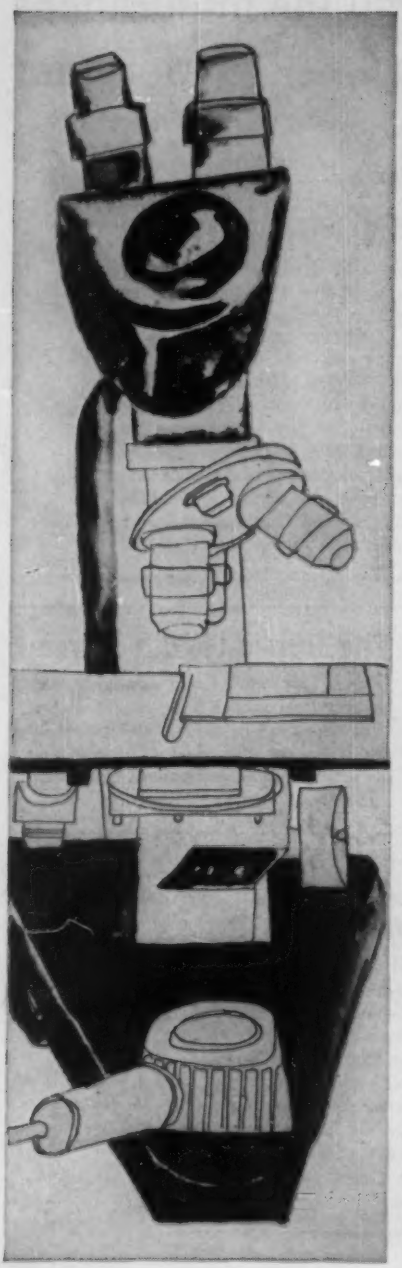

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Galeota, W. R., and Moranville., B. A.: Student Medicine (in press)

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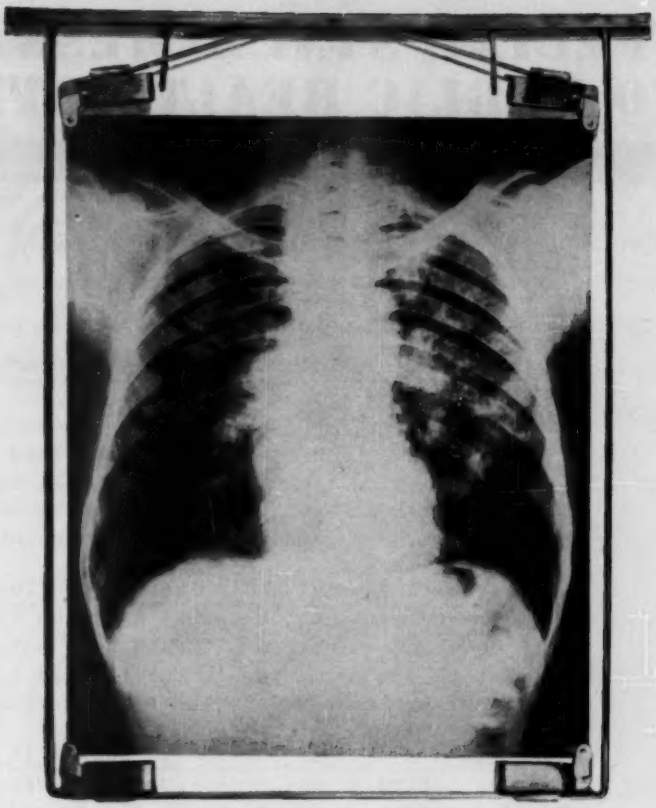

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References: 1. McLean, R. L., and Benson, W. P.: Tr. 15th Conference on Chemotherapy of Tuberculosis, 1956, p. 122. 2. Murdoch, J. M., and Stewart, S. M.: Brit. J. Tuberc. 50:85 (Jan.) 1956.

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(1) Beck, J. W.; Saavedra, D.; Anteli, G. J., & Tejeiro, B.: Am. J. Trop. Med. 8:349, 1959.

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Menu: Orange Juice—4 oz.;
Cereal, dry weight—1 oz.;
Whole Milk—4 oz.; Sugar—1 teaspoon;
Toast (white, enriched)—2 slices;
Butter—5 gm. (about 1 teaspoon);
Nonfat Milk—8 oz.

Nutrients	Calories	Protein	Calcium	Iron	Vitamin A	Thiamine	Riboflavin	Niacin equiv.	Ascorbic Acid
Totals supplied by Basic Breakfast**	303	20.9 gm.	0.532 gm.	2.7 mg.	588 I.U.	0.46 mg.	0.80 mg.	7.36 mg.	65.5 mg.
Recommended Dietary[1] Allowances—Girls, 16 to 19 Years (54 kg.—120 lb.)	2400	75 gm.	1.3 gm.	15 mg.	5000 I.U.	1.2 mg.	1.9 mg.	16 mg.	80 mg.
Percentage Contributed by Basic Breakfast	20.9%	27.9%	40.9%	18.0%	11.8%	38.3%	42.1%	46.0%	81.9%

*Revised 1958, Food and Nutrition Board, National Research Council, Washington, D.C.

**Cereal Institute, Inc.: Breakfast Source Book, Chicago: Cereal Institute, Inc., 1959.
Watt, B. K., and Merrill, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.

[1]The allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. Calorie allowances apply to individuals usually engaged in moderate physical activity. For office workers or others in sedentary occupations they are excessive. Adjustments must be made for variations in body size, age, physical activity, and environmental temperature.

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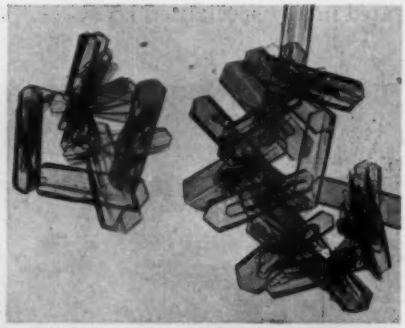

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Journal of Public Health

Traditional public health and its organization are being subjected increasingly to critical scrutiny. What services are needed by a community and how are they to be provided? Some provocative facts are provided by this study of a Colorado county.

PUBLIC HEALTH NEEDS AND PRACTICES IN A GREAT PLAINS COUNTY

Donald Harting, M.D.; Gordon Macgregor, Ph.D.; Irwin Rosenstock, Ph.D., F.A.P.H.A.; and Barkev Sanders, Ph.D., F.A.P.H.A.

THE RESEARCH reported here is neither by a local health department nor in a local health department. Rather, it is research about local health departments —in areas where few exist. The focus of our research is on improving the kinds of information and procedures health officers use in making decisions as to priorities in local health services and ways of providing them. Gradually we are building a body of information which promises to strengthen the health officer's armamentarium for the practice of modern public health. Here I offer a few of the major findings from our first exploratory study and consider some of their implications. But, first, a quick flashback to review the purpose and setting of this study.

Program Purpose

For a number of years the Public Health Service, along with others concerned with public health administration, has been interested in appraising the effectiveness of current public health practices and improving them where possible. The Great Plains was selected for the first studies because the traditional pattern of local public health organization has not flourished there.

Through these studies in sparsely settled areas of the country with few local health departments we are trying to find out: (1) What are the major health problems, "health" being defined in a very broad sense?, (2) how are they now being handled?, and (3) how might

they be handled more effectively? At the same time, we are trying to test and improve the methods available for gathering the necessary data to answer these questions in any part of the country.

We recognized that these broad and diffuse objectives could not be achieved with our available resources. We had to be selective. Two basic choices seemed to be open to us. Should we try to achieve breadth or depth with our initial study? This choice was perhaps analogous to the decision one has to make when using a microscope, whether to first use a high- or low-power magnification. The difference in community research, however, is that the cost of each field that you view runs into the tens of thousands of dollars. We decided to use our resources at first for a low-power view with greater breadth so that we might become generally oriented to the broad range of problems that have been outlined, holding in reserve high-power magnification for use where it seems most worth while.

Selection of County

We chose for this exploratory study an eastern Colorado high plains county, judged by available census data to be a reasonably typical Great Plains county. The county selected is 60 miles long from east to west, 36 miles wide, and is sparsely populated—6,700 people living in an area of 2,200 square miles. In comparison with the country as a whole the population of the county is top-heavy in the over 65-year group with a relatively low number of infants under one year and relatively few persons between the ages of 15 and 35. The weather is violent and variable, but usually dry, sunny, and windy. The terrain is almost flat. As one drives down the only through highway running from east to west, the grain elevator of the next town is visible. Denver, the nearest city of any size, is 180 miles to the west.

The Exploratory Study

Research Goals

For the exploratory phase of our research, the basic effort was to get an over-all view of the health needs of this county—as seen both by professional health workers and by the people themselves. We have included but have not limited ourselves to the kinds of data normally obtained by professional health workers. In addition—through use of the skills of social science—we have attempted to get some picture of the way the people in the county look on their own health problems, the importance they attach to them, and the ways they would go about solving them.

Major Findings

In presenting the findings I shall make no attempt to specify the level of confidence or methodologic limitations of the tools used. These will be discussed in specific papers, such as the one by Dr. Sanders.* In order to facilitate discussion of the implications of these findings for public health practice, let us assume for the moment that our findings in this particular county are typical of the Plains—an assumption that we plan to test. From the data obtained in this exploratory study it is interesting to speculate on the appropriateness of many of the usual activities, or ways of operating, of single or multicounty health units which we have worked hard and unsuccessfully to "sell" to the people in this part of the country.

First are the kinds of illnesses that appear to be the major problems. We commonly use either of two criteria as a basis for judgment as to the major illness problems in a community: (1) the illnesses causing the greatest amount of death or disability in the community in question, or (2) the relative excess of

* See page 1596, this issue.

deaths or disability in the community in question compared with other communities. Using both criteria for judgment that I have just mentioned and recognizing that our morbidity survey has the basic limitations of other morbidity surveys, it appears that the major disease problems in this kind of county include:

1. Heart disease
2. Asthma, hay fever, and other allergies
3. Genitourinary tract problems
4. Arthritis
5. Back trouble and many other problems of the muscles, bones, and joints which interfere with motor function.

These are problems that are especially prevalent in the middle and older age group. In addition, they are problems which would be expected to interfere seriously with the livelihood of farmers or others who earn their living by active physical work. At the present time no organizations are devoting major efforts to finding ways of providing locally the broad range of services that are needed to deal with these problems. Nor are they experimenting with methods for making available the services of physical therapists, occupational therapists, and the other skills that are important in the care of crippled adults as well as crippled children.

What do people in rural areas do when such services are not readily available? Our evidence is incomplete on this point, but the data indicate that at least one frequent solution is to take the problem to the chiropractor. Although the average number of chiropractic services per person per year was lower than for physicians' services, these services were concentrated in the older ages, particularly men. The volume of services was actually greater for chiropractor than for physician's service for men in the 45-54 year age group, a group that might reasonably find arthritis and other conditions that interfere with gross motor ability a serious handicap in doing farm work.

Lest you think that making available services for the care of chronic illness in the county could be achieved by the methods that have been used in many areas of the country, consider some of the impressions of the social scientists on our team.

They found that a high social value was attached to maintaining one's independence and not accepting help. This was especially pronounced where help was not paid for, either in money or reciprocal help. We were not able to identify a single subgroup in this Great Plains community that did not share this dominant value.

Stop and think how many of the services which local health departments in the southeast and in large cities provide —well baby clinics, for instance—that are acceptable to the recipients even though they seem to provide something for nothing. Such services are utilized primarily by subgroups in the population who have historically been heavily dependent on the whims or altruism of the landowner or boss for their necessities and luxuries of life. It is our impression that this traditional approach to the provision of health services would not be acceptable to the people of the county studied.

How many health departments of the Plains area are attempting to act less as providers of service than as agents on behalf of their community to make services available for the care of the chronically ill? For such services, some public sharing of the financial risk would certainly be necessary; however, could it not be arranged for the user of service to pay his share also?

It is the common pattern for local health departments to devote much of their effort to immunization programs and to efforts to get women under medical care early in pregnancy. In this county without a health department we felt that these were two objective and quantifiable indications of the extent to

which individuals have taken preventive health action on their own behalf. Perhaps you will be as surprised as we were. Preventive measures directed to the health protection of children and prospective mothers have been obtained to a high degree in this county. Over four-fifths of the expectant mothers sought prenatal services during the first three months of pregnancy and only in one instance out of 153 was there complete absence of prenatal care.

The proportion of infants and children of preschool age who had been immunized against smallpox, poliomyelitis, diphtheria, whooping cough, and tetanus compares very favorably, on the whole, with other parts of the country. In the age group one to four, the preschoolers, 64 per cent, are immunized against smallpox, 87 per cent against polio, 85 per cent against diptheria, pertussis, and tetanus.

The frequency of preventive actions which would benefit mothers and children and which could be carried out by physicians and patients in the absence of organized community health services was reaffirmed by the finding that visits to doctors for preventive services by children and women in the child-bearing age was much higher than for any other group. We are confident these findings compare favorably with the rates that obtain in most areas in other parts of the country having local health departments. However, it does not come as a surprise to find that the frequency of medical visits for preventive services tapers off almost to nothing as one gets into the adult and older age groups.

Health insurance is a relatively expensive item for people living in this county. Yet, about one-half the people carry insurance. This is approximately the same as in other parts of the country. The thing that is surprising is the fact that almost all of it is carried as individual rather than group policies. This is an expensive form of insurance. The companies writing the individual policies which the people in our sample in this county carry report that they pay back, on the average, 50 cents in benefits for each dollar of premium collected. Many nonprofit plans on a group basis, on the other hand, frequently pay back 90 cents or better for each dollar of premiums. Could our study county support a widespread program of group health insurance? Our social scientists were impressed with the many groups and clubs which are formed in this part of the country for every conceivable purpose. Is it not reasonable for health agencies here to use their administrative and health education skills in helping communities bridge the gap between insurance carriers and the many community organizations to which the people already belong? When we met with some of the community leaders in this county, they certainly seemed to see this as an understandable and tangible problem.

The large number of ready-made social groups also would be an important factor in deciding how to carry out the many nursing and home sanitation activities that were clearly shown to be needed in the county. Cannot we better utilize the natural desires of people for group activity and the assets of such ready-made and effective channels of communication as the Home Demonstration Clubs?

Another surprise to us was the large number of different physicians and dentists who had served the people of this county. Remember, this is a county in which three physicians and one dentist are in active practice and where people live 130 to 180 miles from the nearest city of any size. During the 12-month period preceding the survey, 1,100 families were served by 225 different physicians and 99 different dentists. Obviously, people travel far and wide in obtaining health services. I shall leave it to the nurses to tell me the problems

this situation poses for an effective public health nursing program.

Clearly this is not an area of stable local communities with "old-timers" settled on the land, providing their necessities from the land. Rather, there is a dynamic movement of population in and out of the county, high speculation and risk in farming, great interaction between the major city some 180 miles away for many of the necessities of life, including many of their health services.

Obviously, in so short a time I cannot even mention all of the facets of this single-county picture. For example, there is the whole field of environmental health which I have not directly touched upon in this report.

A different, but equally important area in which we have learned from the study relates to our experience in multidisciplinary research. This kind of research has both satisfactions and frustrations, as one might expect. We have a better sense of its assets and liabilities today than we had two years ago, but it would take another paper to discuss this.

Next Steps

Where do we expect to go from here, now that we are better oriented to this field through our "low-powered 'scope'?" Our leads for further research are in three main directions:

First, to what extent are the findings in this particular county likely to be representative of the Great Plains in general?

Second, assuming that the community undertakes new or revised health programs, to what extent are currently available evaluation methods adequate to measure the effectiveness of such programs? Will we need to develop new evaluation methods?

Third, how can we develop better methods for obtaining data regarding the health needs in any community? In our work so far we have not been satisfied with the methods that are currently available, but we now have some ideas as to how they might be improved.

Summary and Implications

If the study county is typical of the Great Plains region, one of the major areas for which organized community action is needed is the provision of facilities and services to deal with long-term illnesses. Conditions such as arthritis, asthma, mental illness, and multiple disabilities of old age call for a combination of medical and nonmedical skills and for well planned facilities. They also call for a means of insuring the services needed at a reasonable cost to the individual, but in such a way that one does not feel that he is accepting "charity."

These problems may involve some major changes in the way we organize to carry on public health work and in the role of public health people in the community. They may require health workers with new combinations of skills, new ways of financing health services, new kinds of organizational relationships. First of all, however, they mean giving up our dedication to established notions of exactly how health services should be delivered.

Drs. Harting, Macgregor, Rosenstock, and Sanders are associated with the Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C.

This paper was presented before a Joint Session of the Epidemiology, Health Officers, and Statistics Sections at the Eighty-Sixth Annual Meeting of the American Public Health Association in St. Louis, Mo., October 28, 1958.

How good are the data derived from household surveys? This question has been asked and answered by a number of investigators. This study of hospitalization data indicates that the answer depends in part on the purpose of the survey. At the same time some factors that influence the dependability of the data are examined.

HOW GOOD ARE HOSPITAL DATA FROM A HOUSEHOLD SURVEY?

Barkev S. Sanders, Ph.D., F.A.P.H.A.

The Problem

HOUSEHOLD SURVEYS to collect data on sickness and disability within a defined population group are not new in this country. As early as 1880, the national census carried a question on prevalence of disabling illnesses. This was repeated in 1890. Similar data were collected by state censuses (Michigan in 1884 and Massachusetts in 1885, 1895, and 1905). Enumeration of the blind, the deaf, and the mute was retained in the national censuses through 1930.

Interviewing families in a locality to obtain information on incidence and prevalence of illness was conducted by the Public Health Service as early as 1914-1916. The Metropolitan Life Insurance Company in 1915-1917 carried out a series of house-to-house surveys in a number of eastern industrial cities to determine the prevalence of disabling illness among its industrial policyholders and other persons of similar social and economic status.[1] About this time, 1916-1917, the U. S. Public Health Service surveyed a number of southern cotton mill villages. It was on the basis of these findings that the etiology of pellagra was discovered. From 1917 on, morbidity surveys have been made in different areas from time to time by the Public Health Service and other organizations.[2]

Sickness surveys are costly undertakings and call for careful assessment of their reliability and usefulness in terms of the needs to be met.

Morbidity Survey of a County in the Great Plains

The household survey which provided data for the present paper was conducted by the Public Health Service.* It was an integral part of research on public health needs and practices in the Great Plains area. The survey was made in a typical county (Kit Carson) in this area in July and August of 1957.

This paper deals with only one of the many facets of the household survey on morbidity, namely, frequency and days of hospitalization reported by respondents compared with hospital records. Information on hospitalization is only one of many types of medical serv-

* Bureau of State Services, Division of General Health Services, Program Development Branch, Community Research in Public Health Practices Section.

ices in which we were interested; therefore, the space and attention given to it had to be restricted to five questions (53 through 57) in the schedule. Question 53 read, "In the past 12 months, have you been a patient in a hospital, nursing home, or other institution for overnight or longer? (Include deceased persons), (enter name of hospital or institution.)" This information was recorded for the respondent and for all other members of the immediate family.

Only those who had been hospitalized were asked Question 54. It read: "How many days did you spend in the hospital?" However, no specific question was asked to determine the number of separate admissions to a hospital within the 12 months. In instances where the individual was admitted to more than one hospital, the names of the additional hospitals were recorded but the number of days spent in each was not shown. Thus, while total days are recorded, days for each admission are not recorded separately.

The next three questions were restricted to persons in the hospital at the time of the survey. This was in keeping with the entire household survey which was focused on obtaining data on diseases and conditions prevailing at the time of the interview.

The sampling procedure used in the survey was to assign consecutive numbers to all dwellings throughout the county. The numbers were assigned in blocks to dwellings in the "open country" and to each of six towns in the county. All those living in a dwelling with an even number were included in the sample. The sample was so designed that every family within the county had equal probability of being included in the survey.* This sample included 942 occupied dwellings, of which 15 were discovered to be occupied by nonresidents and were therefore, excluded from the survey. No one was found at home for the interview in 23 of these dwellings, despite repeated visits. The residents of 36 dwellings refused an interview. Interviews were completed in 868 dwellings—94 per cent of the total dwellings in the sample for which interviews were planned. The interviewed population consisted of 1,028 families and 2,950 individuals.†

Number of Persons Hospitalized

The information supplied by respondents indicated that 360 persons had been hospitalized at least once within the 12-month period preceding the interview. In all, 28 different hospitals were named where individuals had been hospitalized, exclusive of three instances in which the family could not give the name of the hospital, although they did give the general location. Of the 28 hospitals, two are located in the county, eight in the State Capital 180 miles away, six in other counties in the state,‡ seven in an adjacent state, and the remaining five in more distant states.

Information was obtained from four hospitals which accounted for 307 interviewed persons, or 85 per cent of the number that were reported hospitalized within the 12-month period. One of the four was the county hospital. From this hospital's records, data were abstracted relating to all county residents who had been hospitalized there at any time during 1956 or the first eight months of

* In addition, we interviewed persons in dwellings that were not in the probability sample. These were dwellings from which a birth was registered prior to May 1, 1957, as having occurred in 1956 or 1957. These families are not included in the present analysis.

† Assuming our listing was complete, the coverage of families and particularly individuals in the sample is perhaps better than 94 per cent. The probability of not finding someone at home decreases with increasing family size. Also, dwellings where interviews were refused probably were more often single family dwellings.

‡ Since the names of three hospitals in other counties in the state were unknown, they were not included.

Table 1—Number and Per cent of Agreement of Information for Patients in the Probability Sample for Whom Hospitalization Was Reported in the Household Survey and/or in the Records of the Two Hospitals in the County, for a 12-Month Period

Type of Hospital	Hospitalization Reported by: Survey and Hospital		Survey Only	Hospital Only		Total Shown by Hospital	
	Number	Per cent	Number	Number	Per cent	Number	Per cent
County	227	92.6	16	18	7.4	245	100.0
Proprietary	47	87.0	3	7	13.0	54	100.0
Total	274	91.6	19	25	8.4	299	100.0

1957. The second hospital in the county, a proprietary institution, provided similar information for the interval from June 1, 1956, through September 30, 1957.

The dates of hospitalization of persons whom our interviewers reported as having been hospitalized in state hospital A were obtained from that hospital's records. In the State Capital another public hospital supplied us with information on the persons in the survey who had given it as the place where they had been hospitalized.

Comparison of Hospitalization for the Two Hospitals in the County

We had the unique opportunity to check the data supplied in the household schedule with the hospitalization information abstracted from the records of the two hospitals in the county. Table 1 indicates the extent of agreement between the household survey and the hospital-record data within a 12-month period.

If we use the county hospital list as our criterion of hospitalized individuals, in nearly 93 per cent the information agrees. That is, hospitalization for a given individual is reported both by the hospital and the family respondent. However, there are 18 individuals for whom hospitalization is recorded by the hospital but none was reported by the family respondent.* On the other hand, the surveyed households reported 16 individuals hospitalized in the county hospital which the hospital did not have recorded in that 12-month period.†

In 87 per cent of the proprietary hospital cases both the household survey and the records agree.‡ The hospital shows seven cases that were not reported on the interview schedules.§ There were three individuals reported hospitalized in this proprietary hospital by the sur-

* In eight instances the respondent was the hospitalized person, in six the respondent was the spouse of the hospitalized person, and in four the mother of the hospitalized person.

† Searching hospital admissions for all of 1956 for the community hospital shows that seven of the 16 for whom hospitalization was reported in the survey had been patients in the community hospital, but prior to the 12-month period for which this information was sought. For the other nine, there was no indication of their being in that hospital.

‡ The difference between 93 per cent for the county hospital and 87 per cent for the proprietary hospital is not statistically significant. The standard deviation of the difference is 4.17 while the observed difference is 5.6.

§ In three of these the hospitalized person was the respondent, in two the hospitalized person was the respondent's spouse, and in two the hospitalized person was the child of the respondent.

vey who were not listed by the hospital.*

If one considers the hospital listing as a reliable criterion, the comparison in Table 1 would indicate that the household survey actually failed to report about 8 per cent of the hospitalized individuals. Also, the opposite type of error, i.e., reporting hospitalization for persons who according to this criterion were not hospitalized, is almost equally large.

It is perhaps significant that in 19 of the 25 cases recorded by the hospital but not by the household survey, the hospitalization occurred in 1956, many cases occurring early in the 12-month period terminating with the interview.† Thus, five of the 19 had had their hospitalization more than 11 months before the time of the interview, five were hospitalized more than 10 months before the interview, six others were hospitalized more than eight months before, and the remaining three, more than six months before. It is possible, therefore, that some of the failures to report hospitalization were errors of memory, the respondent believing that hospitalization was outside the 12-month period. It is also plausible that some of these episodes were forgotten, since in nine of the 25 cases the hospitalization was only for one day. Also, in a few cases special circumstances surrounding the interview may account for failure to report hospitalization. None of these explanations, singly or even in combination, could account for all of the discrepancies shown in Table 1. In one case, for instance, there had been two admissions to the hospital, one of these only about four months before the interview, involving in all 27 days of hospitalization which was not reported, the respondent in this case being the wife of the patient. Other cases may also be cited in which neither forgetfulness, possible error, nor special circumstances existing during the interview could account for failure to report. It must be inferred, therefore, that a small number of individuals, for one reason or another, simply did not report hospitalization for themselves or for members of their immediate families.

This deficiency is offset, in part, by another small group for whom hospitalization is reported incorrectly. It is probable, however, that these persons were hospitalized perhaps in a different hospital or during an earlier period. The latter seems unlikely as far as the county hospital is concerned since we had information on all persons hospitalized in that institution in 1956. Because of the offsetting character of these two types of errors—persons reported by the hospital, but not reported on the schedule and, conversely, persons reported on the schedule but not on the hospital roster—it would appear that if the purpose of the survey was merely to determine the proportion of persons hospitalized in a 12-month period, an estimate derived from the survey schedules would have been almost as good as that derived from the hospital records. The survey showed 293 persons hospitalized in the two hospitals in the county, while 299 were entered on the hospitals' records, a shortage of only 2 per cent. However, if one uses such a test as a general reliability index of morbidity information derived by the survey, or intends to correlate hospitalization with other characteristics, the nature and extent of the discrepancies between these two sources as shown by Table 1 take on a more serious character.

Comparison of Days of Hospital Care

We have considered in Table 1 only whether the person was or was not hos-

* Of these, two were hospitalized in 1956 but not within the 12 months from the date of the survey, for the other there was no indication of hospitalization.

† Curiously enough this just about matches the number of individuals reported hospitalized on the household survey in these two hospitals but not found on the hospital listing.

Table 2—Number of Patients and Total and Average Days of Hospitalization Reported on the Rosters of Two Hospitals in a Great Plains County, Compared with Persons Hospitalized and Total and Average Days of Hospitalization in the Same Hospitals Reported in a Family Survey, 1957[1]

Type of Agreement Between Hospital Roster and Survey	Both Hospitals in the County					County Hospital			Proprietary Hospital		
		Total Days		Average Days			Days			Days	
	Patients	Hospital	Survey	Hospital	Survey	Patients	Hospital	Survey	Patients	Hospital	Survey
Total number (reported by hospital)	299	2,074	—	6.9	—	245	1,677	—	54	397	—
Individuals reported hospitalized, both on survey and hospital records											
Same number days both sources	154	850	850	5.5	5.5	123	690	690	31	160	160
More days on survey	75	600	827	8.0	11.0	64	488	676	11	112	151
More days on hospital records	37	342	238	9.2	6.4	33	303	208	4	39	30
Days nonseparable on survey	6	128	[2]DK	21.3	—	5	89	[2]DK	1	39	[2]DK
Days unknown on survey	2	17	DK	8.5	—	2	17	DK	—	—	—
Subtotal	274	1,937	1,915	7.1	7.0	227	1,587	1,574	47	350	341
Days reported by hospital only											
None by survey	25	137	—	5.5	—	18	90	—	7	47	—
Days reported on survey only											
Some by hospital but not in 12-month period	9	[3]	[4]312	—	34.7	7	[3]	[4]305	2	[3]	7
None by hospital	7	—	17	—	2.4	6	—	16	1	—	1
None by hospital (days nonseparable in survey)	3	—	[5]DK	—	—	3	—	[5]DK	—	—	—
Subtotal	19	—	329	—	17.3	16	—	321	3	—	8
Total number (shown by survey)	293	—	2,244	—	7.7	243	—	1,895	50	—	349

[1] Newborn are excluded, even where there is indication from the survey that they remained in the hospital longer than the mother.
[2] DK indicates that the total number of days in specific hospitals is unknown. Schedules indicate 255 days of hospitalization for these individuals; 245 for patients attending the county hospital and another hospital; 10 days for those attending the proprietary hospital and another hospital.
[3] Hospital records show a total of 83 days of hospitalization for these patients, 79 in the county hospital and four in the proprietary hospital. These days were not during the individual's 12-month study year. More days might have been found if hospital records for additional months had been examined.
[4] Two persons reported a total of 289 days of hospitalization included in this total.
[5] These three persons reported a total of 47 days of hospitalization in two or more different hospitals.

pitalized.* When the information on days of hospitalization, as obtained from the household survey, is matched with that obtained from the hospital, the lack of agreement becomes much more serious. The disparities are shown in Table 2. If we use the hospital record again, as our criterion, the number of days derived from the survey matched that obtained from the two institutions in only 154 (52 per cent) of the 299 cases involved. In 75 cases (25 per cent), more days of hospitalization were reported in the survey than was shown by the hospitals' records. In 37 cases (12 per cent) more days were reported by the hospitals than by the survey. In six cases (2 per cent) it was not possible to determine the days spent in the two hospitals from the survey schedules. In these cases the patient was reported to have been in two or more hospitals, but the number of days spent in either of the two hospitals in the county could not be separated from days spent in other hospitals. Two respondents reported hospitalization but could not give the number of days hospitalized. In addition, of course, there were 25 cases shown on the hospitals' records that were not reported on the survey schedules.

* It must be appreciated that there is an unknown but nevertheless possible margin of error in the criterion used. It is conceivable that (1) hospital lists were not clear; or (2) in abstracting, persons were excluded erroneously as nonresidents who were in fact interviewed as residents; (3) erroneous identification of names, particularly persons in the "open country" where the address has little, if any, identifying significance; or (4) errors in processing the data, etc., may account for some of the discrepancies. Conscious of these possibilities every effort was made to avert these happenings, but we cannot be certain that we were successful in all instances. It also must be kept in mind that persons who reported hospitalization could have been hospitalized in hospitals other than the two hospitals in the county, even though they erroneously named a hospital in the county. These are possibilities which cannot be excluded.

Days of hospitalization are also shown by the survey for the 19 patients that were not reported by the hospitals. The hospitals' records showed that nine of these persons had been hospitalized prior to the 12-month period for which information was solicited. The ten other cases were not listed by either hospital. The schedules supplied the number of days in seven of these; for three, the number of days for the two hospitals in the county could not be determined because these individuals reported hospitalization in other institutions as well.

Each source reported 850 days of hospitalization for the 154 patients that could be matched, i.e., cases for which the number of days of hospitalization were identical. This represents 41 per cent of all the days shown for the entire sample by the two hospitals. This gives an average stay for this group of 5.5 days per individual.

The survey reported more days of hospitalization than the hospitals in 75 cases. For these the hospitals reported 600 days, an average duration of eight days per person, representing about 29 per cent of all the days shown by the two hospitals. The days reported by the survey were 827, an excess of 227 days in comparison with the hospital rosters.

For 37 cases, where the hospitals showed more days, the number of days was 342, or one-sixth of the total shown by hospitals. This means an average of 9.2 days per person. The number of hospital days reported by the survey for these same individuals in the two hospitals was 238, or an average of 6.4 days per person. The deficit—104 days—is about 5 per cent of all the days shown by the two hospitals for this group.

In six cases, where the days given by the schedule represent a combination of days in two or more hospitals, the days in the two hospitals in the county cannot be separated from those for hospitals

outside the county. The total days shown by the schedule for these individuals are 255. The days shown by the two hospitals in the county total 128—an average of 21.3 days per patient. If one assumes that on the average one-half of the days were spent in the two hospitals in the county, the total number of days for the group (128) will be the same as that shown by the institutions' records.

The hospitals' records show 17 days for two cases in which the respondent did not know the number of days. This averaged 8.5 days per individual. If one estimates the days in terms of the average, the magnitude will be about the same.

As to the 25 cases for which the survey showed no hospitalization, 137 days were reported by the hospitals. This is 7 per cent of all the days reported by the hospitals and averaged 5.5 days per person.

For the nine cases who, according to the hospital records, had been hospitalized prior to the 12-month period, the days of hospitalization given on the schedule totaled 312. Of this total, 240 days are attributed to one individual and 49 to another. If we exclude these two, the average for the remaining seven would be 3.3 days.* The over-all average would be 34.7 days—hardly a meaningful figure.

The schedules for the seven cases not on the hospitals' rosters showed 17 days in one or the other hospital in the county. This averages 2.4 days per individual. The days spent in these hospitals by the other three cases not on the rosters of the two hospitals, could not be determined from the schedule since hospitalization in other institutions was reported also.†

It is apparent that there are marked discrepancies between the hospitals' records of days of hospitalization in these two hospitals in the 12-month period and those recorded on the schedules. Some of these errors are compensatory. But we have less reason here than in the number of persons hospitalized to assume that the margin of error of days of hospitalization per patient derived from a family interview would necessarily approximate that obtained from the hospital record. In this, we cannot go along with the conclusion reached in an earlier study in San Jose, Calif.[3]

If we did not have the hospital records and wished to approximate from the survey data the days for the two hospitals in the county, we would have perhaps estimated a total of 2,411 days.‡ This figure is 16 per cent more than the total shown by the two hospitals. It must be observed, however, that almost all of this excess is based on the two cases which reported a total of 289 days of hospitalization. In other words, the excess is quite unstable.

As the San Jose experience indicates, it is conceivable that in another survey, similarly conducted and with similar material, the relative days reported may change. In San Jose comparative days were in terms of matched cases. On that basis, our total days would be 2,059

* For these nine cases the hospital records show a total of 83 days, of which 54 are for one individual for whom the schedule shows 240, and six are for a second individual for whom the schedule shows 49. In five cases, the days shown by the hospital agree with those given by the schedule; in one, the days reported by the hospital are greater.

† These three reported a total of 47 days in two or more hospitals, only one of which was the county hospital. If we assume an average of one-half represented days in the county hospital, it will add about 23 days, or nearly eight days per person.

‡ This estimate is arrived at by assuming 128 days hospitalization for the six individuals who reported at least one other hospital besides one of the two hospitals in the county, one-half of the total days reported on the survey. For the two where days of hospitalization were not known we included 16, basing this on the average duration reported by all others. In the three cases with hospital days in other hospitals we used one-half of the days shown, i.e., 23.

based on the schedule and 1,937 based on the hospital records for identical cases, an excess of 6.3 per cent. In San Jose the number of days reported in the survey was less than that obtained from the hospitals, 2,484 and 2,672, respectively—an excess of 7 per cent—about the same absolute magnitude as in the present survey, though different in sign.*

The nature of the errors in number of days of hospitalization reported both by the hospitals and the survey shows that among 228 individuals with one hospital admission, 24 per cent reported an excess of days and 10 per cent a deficiency. Of those reporting an excess in the survey, two-thirds overreported by one day; of those reporting a deficiency, 71 per cent underreported the days by one. There is some indication in both groups that there is less discrepancy in days reported in the survey for individuals hospitalized for a relatively short period of time—five days or less.

In cases having two or more hospital admissions, at least one of which was in a hospital in the county, however, determination of the extent of over- and underreporting is more difficult, since often we are unable to separate the duration of each admission.

Days of Hospital Care per Admission

Comparing hospital with individual records of days of hospital care for each admission, the level of agreement is further reduced. For this purpose, information from two hospitals located in the State Capital was combined with the data derived from the two hospitals in the county. Table 3 shows the extent of agreement between the total days stay per admission obtained by the schedule and those shown by the four hospitals.†

Table 3 shows 374 hospital-reported admissions, which were used as the criterion. This represents 1.21 admissions per individual.‡

Of this total, 374 admissions, only for 44 per cent was the information with respect to days of hospital stay comparable between the criterion and the information derived from the schedule. Other details may be obtained by studying Table 3. The essential finding is that as we increase the number of possibilities for a difference between the criterion and the survey, the percentage of agreement between the two decreases, as one would expect.

Table 3 shows that the extent of agreement between the criterion and our information is markedly lower for the two out-of-county hospitals than for the two hospitals in the county. This may reflect the characteristics of individuals who seek hospitalization in these hospitals, the longer duration of confinement, and perhaps even more, the greater likelihood of multiple admissions.

The extent of agreement between information given by respondents and rosters of these four hospitals varies appreciably for individuals with different characteristics. While we have not tested the statistical significance of these variations, many are large enough to be significant. Our analysis in this respect has indicated that agreement:

1. Is more frequent among individuals living in the "open country" than among those

* The hospitalization period in the San Jose study was from 7 to 11 months; ours is for a 12-month period, though not the identical 12 months for all.

† The schedule did not separate days of hospitalization for each admission for an individual. Therefore, if the total days from the hospital rosters were the same, we have considered this as agreement.

‡ Three hundred and eight different individuals were hospitalized in these four hospitals. The number of multiple admissions would be higher per hospitalized person if we had information from all the other hospitals where residents of the county had been hospitalized in a 12-month period. This suggests a higher multiple hospital admission experience for this population group than has been commonly reported in other studies.

Table 3—Number of Admissions and Total and Average Days of Hospitalization per Admission Reported on the Rosters of Two Hospitals in a Great Plains County and Two Hospitals in the State Capital Compared with the Number of Admissions and Days of Hospitalization for the Same Hospitals Derived from a Family Survey, 1957[1]

Type of Agreement Between Hospital Roster and Survey	Total			Average Days per Admission		Two Hospitals in County			Two Hospitals in State Capital		
		Hospital Days				Admissions	Hospital Days		Admissions	Hospital Days	
	Admissions	Hospital	Survey	Hospital	Survey		Hospital	Survey		Hospital	Survey
Total number (reported by hospital)	374	2,504	—	6.7	—	352	2,074	—	22	430	—
Hospitalization reported, both on survey and hospital records											
Same number days both sources	163	890	890	5.5	5.5	158	850	850	5	40	40
More days on survey	108	772	1,040	7.1	9.6	98	600	827	10	172	213
More days on hospital records	57	467	342	8.2	6.0	55	342	238	2	125	104
Days nonseparable on survey	15	221	[2]91	14.7	6.1	10	128	[2]DK	5	93	[2]DK
Days unknown on survey	3	17	DK	5.7	DK	3	17	DK	—	—	—
Subtotal	346	2,367	2,363	6.8	6.8	324	1,937	1,915	22	430	357
Days reported by hospital only											
None by survey	28	137	—	4.9	—	28	137	—	[3]	—	—
Days reported on survey only											
Some by hospital but not in 12-month period	9	[4]	[5]312	[4]	[5]34.7	9	[4]	[5]312	—	—	—
None by hospital	8	—	18	—	2.2	7	—	17	1	—	1
None by hospital—days nonseparable in survey	3	—	[6]DK	—	[6]DK	3	—	[6]DK	—	—	—
Subtotal	20	—	330	—	16.5	19	—	329	1	—	1
Total number (shown by survey)	366	—	2,693	—	7.4	343	—	2,244	23	—	358

[1] Newborn are excluded, even where there is indication from the survey that they remained in the hospital longer than the mother. The survey schedule did not separate the number of different admissions to the same hospital. It has been assumed, therefore, for purposes of this study, that the number of admissions per individual on the survey is the same as that indicated by the hospital lists. Where hospitalization is not reported by the hospital, the number of admissions for persons reporting hospitalization on the survey has been assumed as one, unless more than one hospital is mentioned.

[2] DK indicates that the total number of days in specific hospitals is unknown. However, for six admissions there was a total of 91 days of hospitalization shown for one of the hospitals in the county and one of the two hospitals studied in the State Capital—these can be included in the total for the four hospitals but not for either subgroup; 164 additional days were reported for the two county hospitals and other hospitals not included in this table, and 10 days were reported for one of the hospitals in the State Capital and another hospital.

[3] In one of these hospitals we obtained information on hospitalization only with respect to persons reporting hospitalization on the survey and did not have an independent list from the hospital.

[4] Hospital records show a total of 83 days of hospitalization for these admissions in the two hospitals in the county. These days were not during the individual's 12-month study year. More days might have been found if hospital records for additional months had been examined.

[5] Two persons reported a total of 289 days of hospitalization included in this total.

[6] Three persons reported a total of 47 days of hospitalization in two or more different hospitals.

living in towns, especially in the smallest towns.

2. Is lower for deceased persons than among living persons.

3. Is highest for children in ages from 5 to 19, declining for persons with increasing age. This is correlated with the fact that agreement is highest when the respondent is the mother of the patient.

4. Is somewhat greater for females than for males, probably because in the vast majority of cases the respondent was female. This is strengthened by the fact that agreement for ages under 20 is higher for males than for females.

5. Is lowest for patients who were divorced, widowed, or separated; and highest for those under 14, and for those 14 and over who had never married.

6. Improves progressively with recency of hospitalization. Hospitalization from 9 to 12 months before the time of the survey had the lowest proportion of agreement.

7. Is highest for patients admitted for tonsils and adenoids, most of whom were children. As has been mentioned before, agreement is relatively high among children. Agreement is second highest for obstetrical patients who are most often the respondents. Agreement is poorest for surgical patients. Among obstetrical patients, those reporting five days have very high agreement, though not others.

8. Varies markedly between individuals visited by different interviewers.

9. Varies with occupation of the head of the family. It is highest for those in families in which the family head operates a farm and does nonfarm wage work as well. The next highest group are persons in families in which the family head did nonfarm wage work only. The lowest of all are members of the pensioners' families and members of families reporting the individual who keeps house as family head.

10. Tends to improve with family income. There are some exceptions to the rule and the range is not too broad.

11. Is highest among individuals having respondents in the age group 25-34, declining as the age of the respondent increases or decreases.

12. Is much poorer for individuals having male respondents. Fortunately, hospitalized persons with male respondents accounted for only 15 per cent of the admissions.

13. Is highest for persons whose respondents gave their employment status as housekeeping, and poorest for those whose respondents were retired.

14. Tends to increase with the educational level of the respondent. It is highest for individuals with respondents having graduated from high school, but decreases for those with higher education. Frequencies in this latter group are small, however, and the variations may not be statistically significant.

15. Increases with size of the family of hospitalized person. The progression is especially marked between families of from one to five persons, but does not stop there. This relationship is even more pronounced for those that had a female respondent.

16. Is highest for patients whose relationship to the respondent is that of child or parent; intermediate where the patient and the respondent is the same person; and lowest where the respondent was the spouse (usually the wife). Agreement is very poor where the respondent is the patient's husband. Where the hospitalized person is the child, agreement is highest for those with one day of hospitalization. Where the respondent is the patient, agreement is highest for those with one and five days of total hospitalization.

17. Is highest for admissions lasting five days and those of one day duration. There is a tendency for agreement to worsen with increasing length of stay.

This preliminary analysis suggests that certain characteristics of the patient and the respondent, their relationship to each other, certain characteristics of the family and circumstances of hospitalization, as well as the individual interviewer involved, influence correct reporting.

General Observation

This comparison of information obtained from families with parallel information derived from hospitals had a dual purpose: First, and what I consider the less important one, is the appraisal of how good are hospitalization data obtained by household surveys. On this point I might agree with the conclusion of Belloc based on the San Jose study that "reports of hospitalization obtained in household sample surveys are sufficiently accurate to be used for many purposes in lieu of hospital record data."[3] In fact, one could go further and say that since, for many purposes, a base population is needed, hospital

records cannot replace information derived from a household survey.

My major interest in this analysis is to infer from the appraisal of the hospitalization data, the level of reliability of other information commonly collected by household surveys where we lack an appropriate criterion. How dependable is the information collected by these surveys? Our analysis indicates that there is need for improvement, especially where the object of the survey is to establish interrelationships such as those between income and illness, illness and occupational pursuits, and even more so when an attempt is made to correlate health status with the volume and types of medical services received.

The analysis which we have presented provides some clues as to ways in which the quality of information collected through household surveys might be improved. Our greatest need, however, as health statisticians, is to rethink and reevaluate for what purposes morbidity surveys are useful tools in terms of their strengths and weaknesses and how their efficiency can be enhanced.

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Salute to Nurses

She stood before the pearly gates,
Her face was scarred and old.
She stood before the man of fate
For admission to the fold.
"What have you done?" St. Peter said,
"To gain admission here?"
"I've been a Public Health Nurse, Sir,
For many and many a year."
The pearly gates swung wide;
St. Peter touched the bell
"Come in and choose your harp, my girl,
"You've had your share of Hell."

(From: New York State Public Health Association Newsletter, 6, 5:18 (May), 1959.)

The epidemiology of exposure to ionizing radiation is an area of urgent interest today. At the same time it is an area in which studies must be carefully designed and executed if they are to have meaning. Dr. Dunham introduces the topic, which is explored along two different lines in the papers which follow this one.

RADIATION HEALTH PROBLEMS AS THEY RELATE TO EPIDEMIOLOGY

Charles L. Dunham, M.D.

SINCE THE DISCOVERY of x-rays and radium in the 1890's limited numbers of people have been exposing themselves to ionizing radiation in varying amounts over and above the exposures resulting from natural radioactivity in the general environment. As early as 1902 skin cancer was observed to be the natural result of overexposure to radiation. Except for sporadic cases of radiation dermatitis and skin cancer clearly related to heavy local radiation exposure, ionizing radiation used to diagnose and to treat disease was not considered to be a hazard warranting the attention of public health officers until 1925, when Martland reported an outbreak of cases of osteitis, anemia, and bone cancer in young women, all employed in the watch dial industry in New Jersey. This study has become a classic in what we might now call radioepidemiology. Meanwhile in Czechoslovakia in the pitchblend mines which had been worked for centuries for a variety of minerals it was known that death from pulmonary disease was the rule. By 1913 it was established that a prime cause of death in these workers was lung cancer and in 1932 it was established that the atmosphere of the mines contained considerable concentrations of radon gas, probably great enough to be the causative agent for the lung cancers. Except for these two dramatic instances radioepidemiology languished until the development of nuclear fission as a method of releasing energy and of producing vast quantities of radioactive materials. At that time great concern was felt for the hazards of dealing with vast quantities of radioactive materials and under the Manhattan District there was begun an extensive research program on the biological effects of ionizing radiation. This program has been carried on in a much expanded form under the auspices of the Atomic Energy Commission in order to provide more precise information on which to base maximum permissible exposure levels for persons working in the atomic energy program.

These experimental studies are being carried out in two major areas; one, estimation of the biological hazard of internally deposited radioactive materials, and, two, estimation of the hazard associated with exposure from external radiation sources. The former entails a more selective exposure, due to the af-

finity of most radioactive materials to particular organs or tissues. However, there is no truly unique difference in the biological effects of exposure to radioactive materials deposited in the body as compared to external radiations. As an adjunct to these experimental studies, searches were made for groups of persons who had been exposed to radioactive materials. Further studies were initiated on persons who had been engaged in dial painting. Patients who had received radium internally as treatment for disease are being sought out and studied for radium content and for changes in the bone structure, and in the blood-forming tissues and for bone cancer. Patients receiving thorotrast intravenously in radiography have also become fair game in this search for delayed effects of internally deposited radioactive materials. Meanwhile the USPHS is surveying the health status of the uranium miner in this country and studying the radiation exposures incurred as well as methods for reducing the exposures.

Developments in experimental radiation biology including radiation genetics have also been backed up by epidemiological studies of selected groups of human beings exposed to unusual amounts of external radiation.

The largest study of this sort is that of the Atomic Bomb Casualty Commission in Hiroshima and Nagasaki, Japan. Thousands of pregnancy terminations have been studied for genetic effects. Radiation-induced lens opacities have been observed among those exposed to appreciable amounts of neutron irradiation from the atomic bombs and an increased incidence rate of leukemia has been clearly demonstrated among the more heavily exposed. The study continues to look for subtler late effects of acute whole body radiation such as curtailment of life span and possible absolute increase or earlier appearance of cancer. Thomas Francis and Alexander Langmuir have been very active in recent years in reorienting the study along sound epidemiological lines.

In this country follow-up studies were undertaken, and are continuing, of patients receiving local x-irradiation to the thymus-thyroid area in infancy, and in England of cases of ankylosing spondylarthritis with radiation to the spine. An apparent increase in thyroid cancer and leukemia has been observed in the former, while an absolute increase or accelerated onset of leukemia has been observed in the latter group. In both countries histories of radiation exposure in utero have been sought among young leukemics and the results suggest a relationship between the exposure and the disease. An increase in the frequency of developmental abnormalities has also been suggested as a consequence of diagnostic in utero irradiation. No evidence has been developed on this latter point to date however.

A number of these studies undertaken in the past ten years, including most of the Atomic Bomb Casualty Commission (ABCC) studies, were initiated by persons not well versed in public health and epidemiologic technics and some slippage has occurred at times.

Interest has heightened in the effects of low level radiation exposures on population groups and new and more extensive studies are being planned. In India on the Travencor monazite sands lives a population of 80,000 persons exposed for generations to several times the usual sea level background radiation. The Indian government, with technical assistance from the World Health Organization and others, hopes to make a careful study of this population to discover possible genetic, leukemogenic and other effects of radiation including curtailed life span. Nearby is potentially an excellent control population of the same stock, the same habits, and of comparable size. In Illinois a study is being initiated of a population whose water

supply has for 60 years contained radium in quantities close to that recommended as permissible by the National Committee on Radiation Protection.

It is helpful to remember that life arose on the earth and has evolved to its present level of specialization in an environment including radiation. It is now known that the intensity of natural radiation reaching all living things is in the order of from three to six ten-thousandths of a roentgen per day or somewhat higher, depending on location, and that the general level was probably somewhat higher when life first originated on the earth. Thus radiation exposure is not entirely an attribute of modern civilization, and it should be apparent that living organisms can exist in radiation fields of very low intensity.

At the opposite extreme, so far as perpetuation of life is concerned, it is known that most mammalian organisms will die in from 30 to 60 days after a brief exposure in the range of 500 to 1000r. Further, it is known that single doses of 100 to 500r will cause various kinds of deleterious effects, including radiation sickness, temporary sterility, developmental abnormalities, cataracts, anemia, leukemia, and in some cases premature death. Going still further, it is known that repeated daily doses in the range of 2 to 10r per day can lead to illness and death in a matter of weeks or months.

Whenever exposures have been gross the cause and effect relationship is reasonably easily established. But where one is looking for the effects of chronic low level exposures the problem is more difficult. We may normally live under very low radiation exposure levels, but it should not be automatically presumed that this exposure has no biological effect. Unfortunately, there are no labels on radiation-induced cancer, mutations, or shortened life span that permit one to single them out from similar effects resulting from other causes, nor are there labels on the possible quantitative consequences, effects on growth rate, vigor, or resistance to disease to name a few which might be involved either as a direct result of chronic radiation exposure or as manifestations of radiation-induced genetic mutation. Studies of this sort call for the most sophisticated of modern, epidemiological methods. They will require extremely careful advance planning, because of the welter of biological and environmental factors whose action can be confused and compounded with any action that might be produced by the radiation exposure. The design and execution of studies of this kind constitute a challenge of the first magnitude.

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This paper was presented before a Joint Session of the Epidemiology and Maternal and Child Health Sections of the American Public Health Association at the Eighty-Sixth Annual Meeting in St. Louis, Mo., October 29, 1958.

Are the lives of radiologists shortened by occupational exposure to ionizing radiation? To explore this problem the mortality experience of radiologists and pathologists was compared. The findings are reported in this paper, and indicate the difficulty of analyzing a problem in which a large number of variables are involved.

THE APPLICATION OF COHORT ANALYSIS TO THE STUDY OF IONIZING RADIATION AND LONGEVITY IN PHYSICIANS

Raymond Seltser, M.D., M.P.H., F.A.P.H.A., and Philip E. Sartwell, M.D., M.P.H., F.A.P.H.A.

ONE OF THE effects of exposure to ionizing radiation demonstrable in laboratory animals is a shortening of the average length of life. This has led to the suggestion that the lives of practicing radiologists may be shortened by their occupational exposure to x-rays. Although there is evidence that the risk of developing leukemia is enhanced in American radiologists,[1-4] the excess deaths from this single, rather rare disease are insufficient to produce any material effect on life expectancy.

It has been shown that comparisons of mean ages at death do not furnish a satisfactory measure of differences in longevity in view of the dependence of this mean on the age distribution of the populations from which the deaths are derived.[5,6] Furthermore, the calendar-time occurrence of deaths among radiologists does not necessarily reflect the calendar-time periods during which the maximum exposure to ionizing radiation took place. In a previous report we suggested that a study of the mortality rates of radiologists and other specialists, specific for age and calendar time (on a cohort basis) would be an appropriate way to secure a valid estimate of differences in longevity.[6] In order to test the practicability of such an approach, a pilot study has been conducted using the membership rolls of two professional societies which were founded at the turn of the century, one of radiologists and for control purposes one of "pathologists and bacteriologists." This paper presents the results of that study.

The hypothesis under investigation is that the occupational exposure to ionizing radiation experienced by radiologists reduces their life expectancy. This would necessarily be manifested in an increase in their age-specific mortality rates. The effect should be greatest in radiologists whose practice began early in the century, before the need for protection was well recognized.

Methods

A. *Data Collection*

The societies picked for study were the American Roentgen Ray Society (ARRS) and the American Association

of Pathologists and Bacteriologists (AAPB). Membership rosters were compiled for both societies and the study included all male physicians from the United States and Canada who had been elected to membership during the period 1905-1954. There were 869 such radiologists, and 1,170 such pathologists.

The information obtained on each individual included the last known address, year of birth, year of election to society membership, and either year of death or confirmation of survivorship through December 31, 1955, for the AAPB members and through December 31, 1956, for the ARRS members. In addition to the files of the societies, the major sources used to obtain these data were the American Medical Directories, the Directory of Medical Specialists, American Men of Science, and various other biographical publications. The reliability of the information obtained was checked by going to the Directory Department of the American Medical Association and reviewing the file cards on all deceased members and on a 10 per cent sample of the living members. In general, excellent agreement was found. Using these technics, it was possible to obtain the necessary information on birth dates and survivorship status for all but two of the 2,039 male physicians from the United States and Canada who had been elected to membership in the two societies during the study period.*

B. *Method of Analysis*

Basic to the methods of analysis used in this study was the separation of the experience of both societies into cohorts, here defined as groups entering their respective societies in the ten-year period 1905-1914, and in each successive ten-year period through 1954. The term cohort as used here, then, refers to a decade of entry into membership, not to a decade of birth. For a particular cohort it is possible to determine the number of person-years of experience in each five-year age group ($_5L_x$) by considering the number who entered the age group from below and the additions, withdrawals and deaths within the age group.†

One method of analysis used involves computation of average annual mortality rates ($_5m_x$) simply by dividing the deaths by the number of person-years at risk $\frac{(_5d_x)}{(_5L_x)}$. Knowing these rates, the expected number of deaths of an age group in the ARRS at the rates experienced by the same age group of the AAPB may be computed by multiplying the death rates of the latter by the person-years of the former. The observed and expected deaths may be summed over all age groups to produce the total observed and expected deaths, which are comparable because the expected numbers are adjusted to the age distribution of the radiologists.

An alternative method is to compute probabilities of dying in successive age groups ($_5q_x$) and by conventional actuarial steps to determine l_x, the number of life-table survivors at age x out of a

* One of these was a Canadian member of the AAPB whose birth date was not found. The other was an ARRS member whose year of election to the society was never determined.

† The equation used is $_5L_x = 5\ (0_x + \frac{_5a_x}{2} - \frac{_5w_x}{2} - \frac{_5d_x}{2} + \frac{_5aw_x}{4} + \frac{_5ad_x}{4})$ where

0_x = the number of persons entering an age group from the next younger age group;
$_5a_x$ = the numbers who joined the society during the five-year age span x to x+5;
$_5w_x$ = the numbers withdrawn alive from observation during the five-year age span for any reason (here it was due to termination of study in 1955 or 1956);
$_5d_x$ = the number dying in the five-year age group;
$_5aw_x$ = the number added and withdrawn alive during the same age span; and
$_5ad_x$ = the number added who also died in the same age span.

Appendix Tables 1-4 present the basic data needed for these calculations and the L_x for the different age groups of the various cohorts.

Table 1—Deaths of Members of American Roentgen Ray Society, by Age (for Ages 35-79) and Cohort of Entry, and Deaths Expected at Rates of Members of American Association of Pathologists and Bacteriologists

Age Group	Cohort of Entry								Cohorts 1905–1944 Combined	
	1905–1914		1915–1924		1925–1934		1935–1944			
	Observed	Expected	Observed	Expected	Observed	Expected	Observed	Expected	Observed	Expected
35–44	3	2.5	3	5.4	2	6.6	0	3.0	8	17.5
45–49	3	3.8	5	5.2	7	6.0	11	2.2	26	17.2
50–54	8	6.3	10	5.4	9	10.6	3	4.0	30	26.3
55–59	8	6.2	17	12.3	12	6.6	11	3.0	48	28.1
60–64	12	8.3	17	15.3	7	9.3	4	3.0	40	35.9
65–69	11	7.1	16	17.4	0	7.9	1	1.0	28	33.4
70–74	9	8.1	17	16.1	4	2.3	2	0.0	32	26.5
75–79	6	6.1	8	20.0	2	0.0	1	0.0	17	26.1
Total	60	48.4	93	97.1	43	49.3	33	16.2	229	211.0

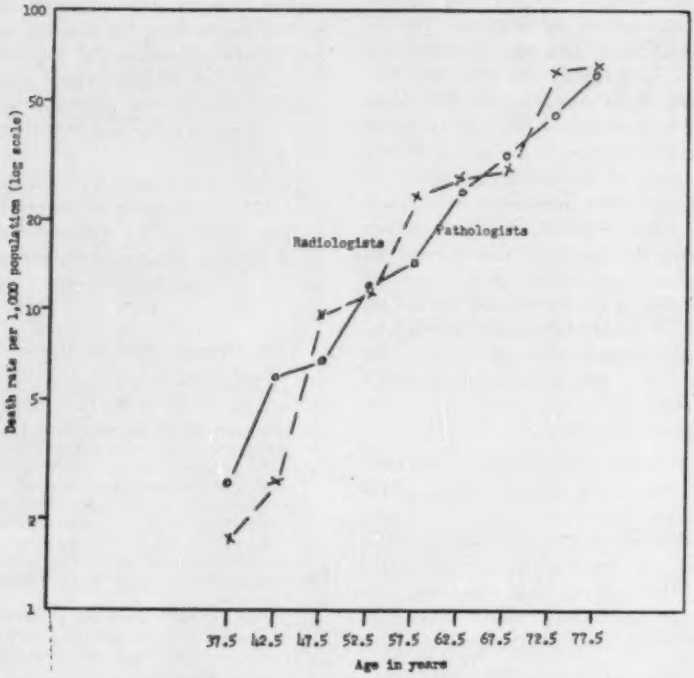

Figure 1—Age-Specific Death Rates per 1,000 Population for Members of the ARRS and AAPB, All Cohorts Combined (1905-1914 to 1945-1954, inc.)

designated number alive at the specific age taken as the starting point of the life-table.

The Study Populations

The composition of the two groups was studied with respect to calendar time of entry of members into the societies; age distribution of the members entering within each time period; and distribution of members according to geographic section of the United States and size of urban or rural area listed as last address. Space does not permit detailed presentation of the findings,* which show that the groups differ somewhat, as follows: Larger numbers of persons were elected to the AAPB in each of the 10-year periods except one, and the average age at entry into the ARRS was older, indicating perhaps that the requirements for election to the ARRS have been more restrictive than those of the AAPB. There are also minor differences in the population-size distributions, pathologists being more concentrated in cities with a population above one million. However, it is felt that these differences are small enough to permit comparison.

The deaths in both societies were distributed in strikingly similar manner in calendar time, and a great majority occurred subsequent to 1930. There was a 3.2-year difference in mean age at death, which is explained by a 3.3-year difference in the mean age at entry (radiologists being the older group with respect to both age at entry and age at death).

Results

A. *Death Rate Analysis*

The analysis of the death rate was limited to ages 35 to 79 since the number of deaths below age 35 and of person-years of experience above age 80 were very small. The data were treated by five-year age groups but the two youngest age classes are combined in certain tables.

The number of deaths in each successive cohort became progressively smaller because of the diminishing numbers of person-years of observation at advanced ages. The cohort of 1945-1954 has such erratic mortality rates, as a consequence of small numbers, that it was omitted from certain of the calculations. Fortunately, we are chiefly interested in the earlier cohorts.

Within the age and cohort classes considered in the analysis of observed and expected deaths (ages 35-79, cohorts 1905-1944) there were 18,371 person-years of observation of 850 pathologists and 13,482 person-years of observation of 588 radiologists, giving average observation periods per person of 21.6 and 22.9 years, respectively.

Table 1 contrasts the observed and expected deaths for the first four cohorts. Between ages 35 and 79, there were 229 deaths of radiologists, contrasted with 211 to be expected if age and time-specific pathologists' rates had prevailed. While there seems to be a difference in the direction indicated by the hypothesis, it is clearly far from having statistical significance. Comparison of the total numbers for each cohort shows a moderate (but statistically nonsignificant) excess of observed deaths over the number expected for the first cohort, small differences in the opposite direction for the next two, and a sizable excess in observed deaths for the fourth cohort.

Figure 1 presents graphically on a logarithmic scale the age-specific death rates for age groups 35-79 in all combined cohorts of both societies. No consistent difference is seen. Figure 2, on the other hand, which is limited to the cohort of 1905-1914, shows a consistently higher rate for radiologists at ages 50-74,

* Appendix Tables 1-7 present the data on which these statements are based. These may be obtained by writing to the author at the Johns Hopkins University.

Table 2—Observed Deaths Among Radiologists in Different Age Groups for Combined Cohorts 1905-1924, 1925-1944 and Total 1905-1944, Contrasted with Expected Deaths at Rates of AAPB Members, United States Physicians 1950, and White U. S. Male Population

Age Group	Cohort 1905–1924				Cohort 1925–1944				Cohort 1905–1944 (Total)			
	Obs. Deaths in Radiologists	Exp. Deaths at AAPB Rates	Exp. Deaths at U. S. Phys. Rates for 1950	Exp. Deaths at U. S. White Male Rates*	Obs. Deaths in Radiologists	Exp. Deaths at AAPB Rates	Exp. Deaths at U. S. Phys. Rates for 1950	Exp. Deaths at U. S. White Male Rates*	Obs. Deaths in Radiologists	Exp. Deaths at AAPB Rates	Exp. Deaths at U. S. Phys. Rates for 1950	Exp. Deaths at U. S. White Male Rates*
35–49	14	16.9	13.9	25.7	20	17.8	15.9	23.6	34	34.7	29.8	49.3
50–64	72	53.8	59.7	68.6	46	36.5	43.2	48.6	118	90.3	102.9	117.2
65–79	67	74.8	77.5	81.5	10	11.2	15.8	17.1	77	86.0	93.3	98.6
Total	153	145.5	151.1	175.8	76	65.5	74.9	89.3	229	211.0	226.0	265.1

* Age-specific rates employed were those for different calendar years, depending on the age group of the cohort (see text).

Table 3—Age-Specific Probability of Dying and the Cumulative Survivorship Beyond Age 35 for Cohort 1905-1914, for all Cohorts Combined 1905-1954, and for all United States Physicians 1949-1951†

Age x to x+5	Probability of Dying During Five-Year Age Span ($_5q_x$)					Number of Survivors Out of 1,000 at Age 35 (l_x)				
	AAPB		ARRS		U. S. Physicians	AAPB		ARRS		U.S. Physicians
	1905–14	1905–54	1905–14	1905–54	1949–51	1905–14	1905–54	1905–14	1905–54	1949–51
35–39	0.013	0.013	0.016	0.009	0.010	1,000	1,000	1,000	1,000	1,000
40–44	0.023	0.030	0.026	0.013	0.021	987	987	984	992	990
45–49	0.045	0.033	0.036	0.047	0.036	964	957	958	978	969
50–54	0.076	0.058	0.096	0.057	0.056	921	925	924	933	924
55–59	0.082	0.070	0.105	0.110	0.087	851	872	835	879	872
60–64	0.124	0.118	0.174	0.130	0.143	781	811	747	782	796
65–69	0.129	0.188	0.193	0.137	0.204	684	715	617	681	683
70–74	0.193	0.203	0.212	0.262	0.292	596	580	498	587	544
75–79	0.235	0.270	0.231	0.283	0.400	481	463	392	433	385
80						368	338	301	310	231

† Figures adapted from Dickinson and Martin.[7]

although the numbers on which these rates are based are small.

Observed mortality was next compared with that of the general population and of all physicians. In computing expected deaths at the rates of all United States male physicians, the rates developed by Dickinson and Martin[7] for the years 1949-1951 were employed,* while for the general white male population rates for censual years from 1920 through 1950 were used.

It can be seen from Table 2 that the observed deaths are less than those to be expected if United States white male rates were applied, and very similar to those expected at United States physician rates. The small numbers do not allow us to draw any definite conclusions, and considering the large standard errors of the observed deaths, it is still possible that a considerable difference could exist, and not have been detected in a sample of this size. The data are grouped according to 15-year age classes, and 20-year cohorts. Such grouping focuses attention on the 50-64 year age group in which the largest differences appear.

* It would have been preferable here to use earlier rates for the younger age groups of earlier cohorts, but none were available by five-year age groups. It must be recognized that the expected deaths for physicians are somewhat too low in these younger age groups of the earlier cohorts, but the totals are probably not far wrong, because most of the deaths are in older age groups and in a recent period.

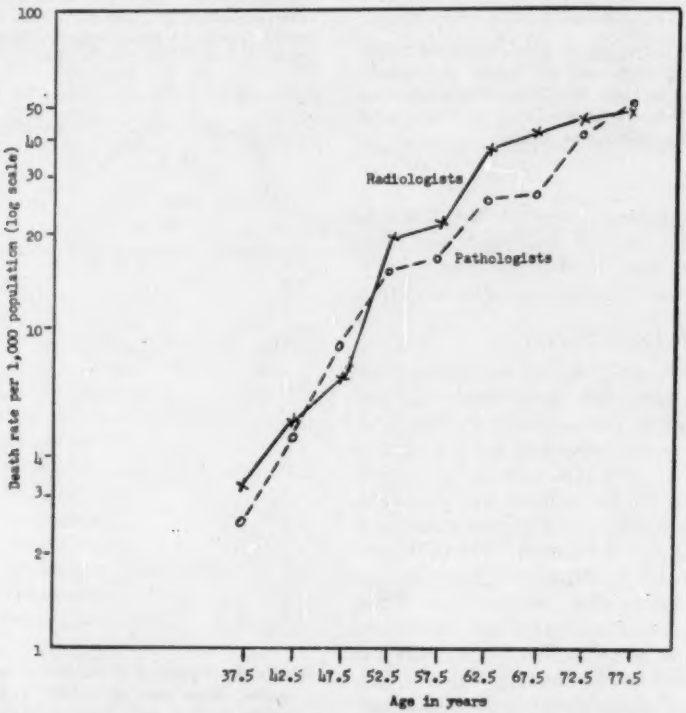

Figure 2—Age-Specific Death Rates per 1,000 Population for Members of the ARRS and AAPB Entering Their Societies During 1905-1914

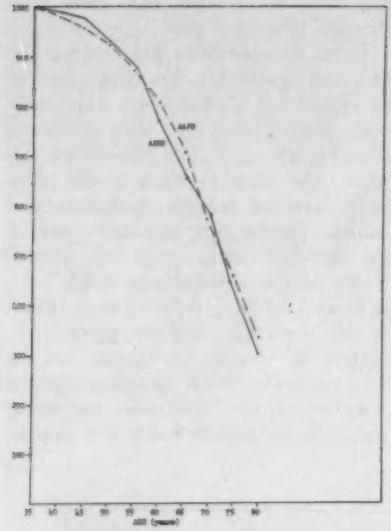

Figure 3—Number of Survivors to Designated Ages out of 1,000 Individuals Alive at Age 35 (l_x). Experience of all Cohorts (1905-1914 to 1954, inc.) of the ARRS and AAPB.

The difference between the observed mortality rates of radiologists and pathologists aged 50-64 in the cohorts 1905-1924 was 1.38 times its standard error.

B. *Life-Table Analysis*

A life-table analysis was made, from which values for survivorship (l_x) and age-specific probabilities of dying ($_5q_x$) of the two memberships are provided in Table 3. For this analysis, the experience of all five cohorts was combined. Life-table figures for United States physicians for the period 1949-1951[7] are included for comparison. The survivorship figures show no consistent differences at successive ages, and the median duration of life is found to be only one half year less for the radiologists, a finding well within the limits of chance variation. Furthermore, we can show from the upper 95 per cent confidence limit that the true difference in median duration of life between these two groups is unlikely to be greater than 3.4 years.* Figure 3 presents the survivorship curves graphically.

Life-table figures for the first cohort (1905-1914) have been included in Table 3, and are graphically presented in Figure 4. Although no significant difference can be demonstrated, a true difference in median duration of life of as much as ten years could exist and still not have been demonstrable as statistically significant at the 95 per cent confidence level.

* Standard errors for the survivorship (l_x) figures were computed according to Greenwood's formula.[8] The upper 95 per cent confidence limits of the AAPB values and the lower confidence limits of the ARRS were plotted and the standard error of the median value estimated graphically. From this, the standard error of the observed difference between median values was calculated.

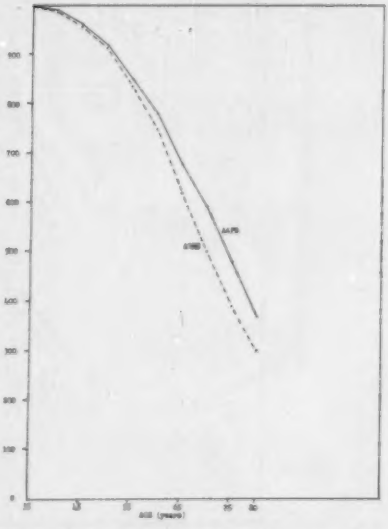

Figure 4—Number of Survivors to Designated Ages out of 1,000 Individuals Alive at Age 35 (l_x). Experience of Cohorts 1905-1914 of the ARRS and AAPB

C. *Causes of Death Among Members of AAPB and ARRS*

A preliminary analysis of causes of death was carried out. Table 4 presents the age-adjusted cause-specific death rates for the entire 1905-1954 experience. Since the causes of 28 per cent of pathologists' and 20 per cent of radiologists' deaths have not yet been ascertained, these figures must be interpreted with great caution. It is of interest that the rates for heart disease, cancer, and vascular lesions of the CNS are similar in the two groups. There apparently is a sixfold excess of leukemia among radiologists and an excess tuberculosis death rate of similar magnitude among pathologists.

Discussion

This study was undertaken primarily to test the practicability of using the method of cohort analysis in studying the possible effect of ionizing radiation on longevity of physicians. In spite of the failure to demonstrate true differences between the radiologists and the control group, there are several benefits to be derived from this type of investigation. The use of a control group of specialists rather than reliance on only United States physicians or United States white males seems highly desirable in view of the demonstration in previous studies that physician mortality is lower than that for all white males, and the mortality of specialists is even lower than that for all physicians.[4,7] Other specialists might be more suitable controls, since an excess risk from tuberculosis in pathologists might counterbalance an influence of radiation in radiologists.

The method of cohort analysis allows us to study separately the group which we have reason to suppose was most heavily exposed to radiation. Assuming that radiation in the dosage experienced prior to 1925 was life-shortening, inclusion of the experience of radiologists subsequently entering the profession might tend to conceal a true effect.

Table 4—Causes of Death Among Male Physician Members of the ARRS and AAPB, Ages 35-79, Entering Their Societies During the Period 1905-1954

Cause of Death	ARRS		AAPB	
	No. of Deaths	Age-Adjusted* Death Rate per 100,000 per Year	No. of Deaths	Age-Adjusted* Death Rate per 100,000 per Year
Heart disease	79	493.2	81	431.6
Vascular lesions of CNS	16	98.4	18	96.8
Pneumonia	7	46.1	8	42.2
Tuberculosis	1	6.1	7	36.1
Leukemia	11	69.3	2	10.9
Other cancer	21	130.0	24	129.6
Aplastic anemia	3	18.2	1	5.5
"Radiation injuries"	4	26.8	0	0
Violent deaths	14	83.7	16	77.7
Other known causes	33	211.3	19	98.8
Cause not available from AMA files	46	281.7	68	361.3
Totals	235	1464.8	244	1290.5

* The combined population of both societies was used as the "standard population" in computation of age-adjusted rates

The deficiencies of this study are not a reflection on the method, but are due rather to several other limiting factors.

A. Numbers—It is clear from our results that small differences in mortality rates could not be detected with populations of the size employed here. Future studies must utilize populations which contribute at least twice as many person-years as these societies have furnished in certain age classes.

B. Initial Selection—In choosing for study the members of two professional specialty societies, uncertainties of selection for membership out of the specialty arise which cannot be evaluated. We have examined certain of these, but do not know about economic, social or occupational factors which may have some effect on mortality. In addition, the forces which lead a physician to become a specialist are undoubtedly complex. Some of these forces would not be expected to influence subsequent mortality, but others, such as an individual's previous health status, certainly could exert such an influence. If we assume that individuals are in good health at the time they enter a specialty or a specialty society we have a factor of "favorable selection." On the other hand, we might assume that persons suffering from chronic illness such as tuberculosis, diabetes or rheumatic heart disease will choose to enter a medical specialty such as radiology or pathology in which the hours are regular and the physical demands less exacting than those of fields such as general practice, surgery or obstetrics; this would lead to "unfavorable selection." Both types of selection would be expected to operate chiefly in the younger age groups, and the effect might disappear by the age of 40 or 50. Whether these types of selection would neutralize each other, or have a net effect of enhancing or reducing the mortality rates is not known. The question in this study is whether these selective factors are operating to a different degree among radiologists than among pathologists,* and this has not been ascertained.

There are several likely interpretations of these findings as regards the effect of ionizing radiation on longevity in radiologists:

(1) There may be no effect, but it is not possible to demonstrate this statistically since it would require an infinite number of subjects.

(2) There may be a true effect equal in magnitude to or smaller than that observed when comparing the radiologists with the pathologists. If this is true, more extensive observation will be required to demonstrate this conclusively. Such an effect might well be no greater hazard to radiologists than hazards existing in other specialties, which have been accepted by physicians. Furthermore, it may be chiefly limited to radiologists who began practicing in the early part of the century, and hence of no practical significance today.

(3) There may be a true effect greater than that observed. Our sample suggests that for the entire experience this would be no greater than a 3.4 year effect on median duration of life. In the 1905-1914 cohort, there are indications that a larger effect might exist. This warrants the study of larger groups.

The problem would be clarified if it were possible to relate mortality experience to a quantitative estimate of the exposure of individual radiologists to ionizing radiation. One of the major deficiencies of this study is the inability to do so. The exposures of the individual radiologists whose experience is summarized have undoubtedly varied widely, depending on size of radiological practice, employment of technicians, type of

* To reduce the possible effects of initial selection, the data were retabulated omitting the experience of the age groups under 45, and drawing up a survivorship curve starting with 1,000 individuals living at age 45, when we would expect the effects of initial selection to have largely disappeared. This resulted in an increase in the differences between the survivorship curves of the two groups.

equipment, use of protective measures, and other factors. Estimates of the total roentgens received by some of the early radiologists range as high as 3,000 to 4,000 r.[9]

The excess proportionate mortality from leukemia among radiologists is statistically significant and presumably reflects a true occupational risk, although deaths from leukemia may be more completely reported in the case of radiologists. Our figures are similar in this respect to those reported previously by several American authors.[1-3]

Court Brown and Doll[10] have recently published the results of a study similar to this and based on somewhat larger numbers of British radiologists. They did not utilize a control group in another specialty, but obtained three estimates of expected deaths derived from the mortality rates of the male population of England and Wales, men in the highest social classes, and physicians. They found that British radiologists had a more favorable mortality experience than any of the other groups. An excess of cancer deaths was found among the men entering the practice of radiology prior to 1921. Our preliminary figures for the 1905-1914 cohort also suggest an excess of cancer deaths. Only a "possible" excess in leukemia was observed among the British radiologists based on three deaths as compared with one expected at the general population death rate. This is in contrast with the 11 leukemia deaths already documented in our incomplete cause of death data.

Summary

1. The mortality experience of male physicians from the United States and Canada who became members of the American Roentgen Ray Society and the American Association of Pathologists and Bacteriologists during the period 1905-1954 has been analyzed, keeping the data specific for age and for cohort of entry into the respective societies.

2. Differences existing between these two groups with respect to time of entry, age of entry, and geographic location of the members of the two societies have been examined and are considered small enough to permit comparisons, considering the pathologists as a control group.

3. There is a suggestion that for the cohorts entering the societies between 1905-1914 (the earliest period) the mortality rates of the radiologists above the age of 50 exceed those of the pathologists. The differences are not statistically significant, but are of sufficient consistency to warrant the view that a larger experience might reveal a significant difference.

4. The data for the entire 50-year cohort reveals no significant decrease in the survivorship of radiologists, compared to pathologists. Radiologist mortality was similar to that of all United States physicians, and somewhat lower than that of United States white males.

5. Analysis of incomplete cause-of-death data shows an apparent excess of leukemia among radiologists. The magnitude of this excess is about equal to the apparent tuberculosis excess in the control group.

6. This method of study appears suitable for detection of differences existing in the hazards to radiologists practicing at different calendar time periods. Larger groups will be needed in order to obtain definitive findings. However, even with the small numbers in these groups, it can be estimated that the maximum effect on median duration of life is likely to be no greater than from three to four years.

ACKNOWLEDGMENTS—We are indebted to Dr. Barton Young, former secretary of the American Roentgen Ray Society, and to Dr. Russell Holman, secretary of the American Association of Pathologists and Bacteriologists, for their cooperation in making available the files of the respective societies; to Dr. F. J. L. Blasingame of the AMA for permission to examine the AMA records; and to Robert Enlow, Virginia Dwyer, and Joseph Mishida of the AMA Circulation and Records Department for their assistance. We wish to acknowledge the technical assistance of the following members of our staff: Jean Galkin, Margaret McConnell, Hermine Bird, and Mildred Dorsey.

We gratefully acknowledge the encouragement and advice of Dr. Margaret Merrell, both in the initiation of the study and in the analysis of findings.

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Alaska Unites Health and Welfare

The Alaska State Health Legislature has created a new Department of Health and Welfare by combining the former Departments of Health and of Welfare which are now divisions under a single commissioner appointed by the Governor with the approval of the Legislature. In addition, the former Department of Juvenile Institutions, the Advisory Hospital Council and the Water Pollution Control Board have been transferred to the new department. Alaska thus becomes the third state with a combined Department of Health and Welfare, the other two being Maine and Missouri.

In taking office the new commissioner of the department, Paul Winsor, spoke of the opportunity of integrating the state's health and welfare programs and developing a close working relationship with the Alaska Native Health Service and other related government and voluntary agencies. Mr. Winsor has been in Alaska since 1950 and, since 1957, has been Anchorage area field representative for the Alaska Native Service which is the Alaska operation of the Bureau of Indian Affairs of the Public Health Service. Harry V. Gibson, M.D., former commissioner of health continues as director of the Division of Health.

In a study of births to related parents who had been exposed to radiation in the bombings of Hiroshima and Nagasaki no consistent effect on the frequency of malformed infants or perinatal deaths was demonstrable. However, this "negative" study helps to make more precise the area where the search for genetic differences must be carried on.

ATOMIC BOMB EXPOSURE AND THE PREGNANCIES OF BIOLOGICALLY RELATED PARENTS

A PROSPECTIVE STUDY OF THE GENETIC EFFECTS OF IONIZING RADIATION IN MAN

William J. Schull, Ph.D., and James V. Neel, M.D., Ph.D.

THE CONCEPTS and particularly the technics of modern epidemiology are surprisingly similar to those which the geneticist associates with what he terms population genetics. It is one of the purposes of this presentation to indicate this parallelism in approaches through a consideration of a study of the genetic effects of ionizing radiation in man. While the data to be reported have not previously appeared in the literature, we shall emphasize methodology here rather than data.

The prospects for genetic damage following exposure to ionizing radiations have been admirably summarized in the reports of the U. S. National Academy of Sciences-National Research Council (1956), the British Medical Research Council (1956), the World Health Organization (1957), and more recently, the United Nations Scientific Committee on the Effects of Radiation (1958). We shall assume that the substance of these reports is now a matter of common knowledge and, we shall, therefore, not review the experimental observations from which one argues that a genetic risk will accrue from the exposure of human beings to ionizing radiations. Assessment of this risk in man has been hampered by a lack of basic information regarding such variables as spontaneous rates of mutation, selection pressure, average overdominance of nominally recessive mutant genes, and others. Furthermore, and fortunately so, the number of human populations exposed to high or moderately high amounts of ionizing radiations are few. One such population, however, comprises the survivors of the atomic bombings of Hiroshima and Nagasaki. The bulk of the results of a comprehensive study of the effect of exposure to the atomic bombs on this population has been reported elsewhere.[1,2] In the major report, attention was confined to observations on pregnancies occurring to unrelated parents. During the same interval of time, namely, 1948-1953, observations were also obtained on some 5,163 registered pregnancies occurring

in Hiroshima and Nagasaki to parents who were related as first cousins, first cousins once removed, or second cousins. There are a number of reasons why the geneticist is inclined to view the latter pregnancies of related parents as potentially a more sensitive index of radiation-induced genetic damage. In its simplest terms, the main line of the argument is that the addition of radiation-induced mutants to the more homozygous, and presumably less elastic, genetic background of inbred children may produce a relatively greater effect than would be apparent if the same mutants were superimposed on the more heterozygous genetic background of noninbred children, that is, children born to unrelated parents. It seemed unwise, therefore, in the analysis of the data from Hiroshima and Nagasaki, to simply pool the present observations with those on noninbred children, particularly since the inbred children were not uniformly distributed over the various exposure classes to be described shortly. The present report serves then to complete the picture of the effects of parental exposure to the atomic bombing of these two cities.

Brief Description of the Program—In the years immediately following World War II, a ration system existed in Japan which permitted pregnant women to acquire certain rationed items by registering the fact of their pregnancy some time after the fifth month of gestation. The economic milieu of Japan in this period was such that registration was virtually complete. There existed, then, a set of circumstances which afforded an opportunity to launch a comprehensive prospectively oriented study of pregnancy terminations following parental irradiation. With the cooperation of the municipal authorities in Hiroshima and Nagasaki, a system was instituted in 1948 whereby at the time of her registration for rations, each pregnant woman or her representative also registered with the Atomic Bomb Casualty Commission (ABCC), an agency of the National Academy of Sciences-National Research Council working in cooperation with the National Institute of Health of Japan. At the time of registration, the first two-thirds of a questionnaire was completed which included such items as identifying information, a brief radiation history of the husband and wife, a short summary of the past reproductive performances, and pertinent details concerning the present pregnancy. Upon the termination of the pregnancy, the attending midwife or physician notified the ABCC, and completed the previously mentioned questionnaire. Irrespective of the type of termination, a Japanese physician in the employ of the ABCC or the Japanese National Institute of Health called to examine the child as promptly after birth as possible. The completeness of this system of reporting and follow-up was checked periodically; these checks revealed that approximately 93 per cent of the births occurring in Hiroshima, and a somewhat higher figure in Nagasaki, were known to the commission. A large proportion of the 7 per cent not ascertained through this scheme subsequently came to our attention through other channels. The latter, unregistered births, while not included in the results to be reported, permit an appraisal of the representativeness of the registered births.

In the event that a pregnancy terminated abnormally as in a stillbirth or a child with a congenital malformation, a supplementary questionnaire was completed in the patient's home by the examining physician. This questionnaire was designed to obtain more detailed information on the gynecologic history, maternal illness during pregnancy, past reproductive performance, and economic status. In addition to this questionnaire, blood was drawn from the mother for a serological test for syphilis (on the average, some 5 per cent of these tests were positive). The same supple-

mentary questionnaire was routinely completed on every registration where the terminal digit in the registration number was zero.

A more complete description of the program will be found in Neel and Schull.[1] Information bearing on the reliability of the consanguinity data, and the importance of certain socioeconomic concomitants on the data to be presented has been given elsewhere.[3]

Parental Radiation Exposure—Clearly to extract the maximum information from the situation we have described, an experimental design more sophisticated than the simple dichotomy, exposed-not-exposed, was needed. Available to estimate the exposure of a given individual was information on (1) his or her distance from ground zero at the time of the bombing, (2) the occurrence of epilation, gingivitis and petechiae, symptoms highly correlated with radiation sickness, and (3) the shielding he or she may have experienced. Available also was some knowledge regarding the neutron and gamma dose, in air, at specified distances from ground zero. The latter information was considerably less precise than could be desired, or than is frequently imagined. The distance-dosage relationships have been repeatedly revised in the intervening 13 years, and will most probably undergo further revision. This, then, was the background on which one had to decide how best to recognize varying degrees of radiation exposure.

In general, two solutions to the problem of estimating degree of exposure were available. On the one hand, one could attempt to assign a score to each exposed individual, this score being a function of distance, shielding, and symptomatology. If applicable, this approach would permit the use of somewhat more elegant procedures for estimating the dose-genetic effect relationships than could be used with the second alternative. It has the disadvantage, in practice, of requiring a value judgment in the assignment of almost every score, and as a consequence, the apparent precision in estimating the genetic effect may well be spurious. On the other hand, one could adopt a classificatory scheme. The principal advantage of the latter, perhaps, is that it is the more conservative of the two procedures, and less subject to dating by revisions in the basic distance-dosage relationships. The classificatory scheme evolved to take into account distance, shielding, and symptomatology was as follows:

1. Not present in Hiroshima or Nagasaki at the time of the bombings.

2. Present in one or the other of the two cities, but asymptomatic, and at a distance from ground zero (a) greater than 3,000 meters, or (b) 0-3,000 meters and heavily shielded, or (c) 1,500-3,000 meters and moderately shielded, or (d) 2,000-3,000 meters and lightly shielded.

3. Present but asymptomatic, and at a distance of (a) 2,000-3,000 meters and unshielded, or (b) 1,000-2,000 meters and lightly shielded, or (c) 0-1,000 meters and moderately shielded.

4. Present but asymptomatic, and at a distance of (a) less than 2,000 meters and unshielded, or (b) less than 1,000 meters and lightly shielded.

5. Present but less than 3,000 meters from ground zero, and reporting epilation a/o gingivitis, a/o petechiae.

The structures which were defined as affording heavy, moderate, or light shielding are given in Neel and Schull.[1, p. 44] From a variety of sources of evidence, it has been estimated that these five categories of exposure correspond to doses of approximately 0, 5-10, 40-80, 100-150, and 200-300 roentgens equivalent physical respectively.

The Data—Of the 5,163 registered pregnancies of related parents which were observed, 382 were rejected prior to analysis for a variety of reasons, among these reasons being (1) incomplete information on birth weight, birth rank, maternal age, or parental exposure, (2) relationship of uncertain degree, more remote than second cousins, or closer than first cous-

Table 1—The Distribution of Births to Parents Related as First Cousins, First Cousins Once Removed, or Second Cousins by City and Parental Exposure

a. Hiroshima

		Mother's Exposure 1	2	3	4–5	Total
Father's Exposure	1	1,141	293	89	71	1,594
	2	91	108	22	9	230
	3	40	23	16	6	85
	4–5	22	16	3	5	46
Total		1,294	440	130	91	1,955

b. Nagasaki

		Mother's Exposure 1	2	3	4–5	Total
Father's Exposure	1	1,481	670	65	33	2,249
	2	204	286	13	10	513
	3	13	22	7	–	42
	4–5	8	8	4	2	22
Total		1,706	986	89	45	2,826

ins, (3) induced pregnancy terminations, and (4) multiple births. Table 1 gives the distribution of the remaining 4,781 births to related parents by parental exposure and city. Because of the paucity of individuals falling into exposure categories 4 and 5, these individuals are combined with group 3 in all subsequent tables (the estimated mean exposure for the combined groups (3-5) is about 100 reps).

Ideally in the analysis of these data, the precise relationship of the parents would be taken into account by a procedure, say, such as regressing the variable in question on the coefficient of inbreeding within each of the various exposure cells, and then testing the homogeneity of the intercepts and regression coefficients so obtained. Unfortunately, the data are insufficient, particularly at the higher combined parental exposures, to make this approach feasible. A less sensitive procedure is to pool the various types of parental relationship within each of the exposure cells, and then contrast the pooled observations. The validity of this latter approach rests on several assumptions, the most important of which is that the average coefficient of inbreeding, as well as the variances of these coefficients, is the same in each of the exposure cells. Table 2 presents the weighted average coefficient of inbreeding for the nine exposure cells. It will be noted that these values range from 0.0391 to 0.0501, but in general, cluster fairly tightly around the mean over-all exposure cells, namely, 0.0459. The within exposure cell variances exhibit a comparable range of variation to that observed among the means. Thus, it would seem that the related marriages encountered in the exposure cells are sufficiently similar in type and frequency that to pool the observations on the various degrees of relationship within exposure cells would not lead to significant confounding of inbreeding effect with the effects due to parental exposure.

Information is available on the following variables presumably indicative of

Table 2—Mean Coefficient of Inbreeding Among the Offspring of Related Parents by Parental Exposure. The Numbers of Observations on Which These Means Rest Are Given in Parentheses

		Mother's Exposure 1	2	3–5	Total
Father's Exposure	1	0.0457 (2,622)	0.0466 (963)	0.0451 (258)	0.0459 (3,843)
	2	0.0453 (295)	0.0468 (394)	0.0391 (54)	0.0457 (743)
	3–5	0.0444 (83)	0.0501 (69)	0.0421 (43)	0.0459 (195)
Total		0.0457 (3,000)	0.0468 (1,426)	0.0438 (355)	0.0459 (4,781)

genetic radiation damage, the sex ratio, the frequency of major congenital malformations, the frequency of stillbirths, the frequency of death in the first week of life among liveborn children, birth weight, and certain anthropometric data obtained approximately nine months post partum on a sample of those surviving to this age. The observations on the sex ratio have been presented elsewhere[2] as has the information on birth weight and the anthropometric measurements.[4] No significant differences among exposure cells in the birth weights (means or variances) or among the anthropometric measurements were demonstrable. The sex ratio data on the offspring of the related parents alone did not reveal a significant exposure effect. However, when taken in conjunction with the data presented on the unrelated parents, there emerged small, but consistent differences in the sex ratio compatible with the effects to be expected if sex-linked lethal genes were induced by the radiation. We present here the observations on the frequencies of major congenital anomalies and perinatal mortality (stillbirths plus deaths in the first week of life).

The specific malformations defined as major are tabulated in Neel and Schull[1]; in substance, any malformation which was incompatible with life, or, if compatible, seriously limited the function of the individual, was defined as a major malformation. The distribution by parental exposure and city of birth of children with major congenital malformations born to related parents is given in Table 3. In the analysis of these data, observations from Hiroshima and Nagasaki have been pooled to increase the numbers of entries in the exposure cells. This assumes that there is no heterogeneity between cities, an assumption which may not be strictly true. However, in an analysis of the effects of inbreeding on pregnancy termination in Japan based upon children born to parents who were either unexposed or lightly exposed (category 2), Schull[3] found no evidence of heterogeneity between Hiroshima and Nagasaki in the regression coefficients when the frequency of major congenital malformations was regressed on the coefficient of inbreeding F (including $F = 0$, that is, the offspring of unrelated parents). There was, however, evidence of heterogeneity in the regression of "early deaths" on the coefficient of inbreeding. The term "early death" does not cover a period of time equal to that encompassed by "perinatal death." The former includes death from the seventh day of life to the end of the first month. Since most deaths in the first month occur, in fact, in the first week, it is reasonable to assume that heterogeneity would also exist between cities with regard to perinatal mortality, and this can be shown to be true.

Analysis of the observations on major congenital anomalies by either the method of Roy and Kastenbaum[5] or regression technics failed to reveal a significant effect of maternal or paternal exposure on the frequency of major congenital malformations. The regression model used was of the following general form:

$$E(p_{ij}) = \bar{p} + b_1 (F_i - \bar{F}) + b_2 (M_j - \bar{M})$$

where $E(p_{ij})$ is the expected proportion of malformed infants in the ij^{th} exposure cell, $\bar{p}$ is the average proportion of malformed infants, b_1 and b_2 are regression coefficients, F_i and $\bar{F}$ (M_j and $\bar{M}$) are respectively the average exposure of fathers (mothers) in the i^{th}(j^{th}) exposure category and the mean paternal (maternal) exposure. In actual computation, a weighted regression was fitted using the arc sin transformation rather than the observed proportions. It must, of course, be borne in mind that the application of regression methods to these data involve an element of approximation. As might be surmised from inspection of Table 3, the regression co-

Table 3—The Distribution by City of Birth and Parental Exposure of Infants with Major Congenital Anomalies Born to Parents Who Were Biologically Related

a. Hiroshima

Father's Exposure			Mother's Exposure 1	2	3–5	Total
		N	1,141	293	160	1,594
	1	m	18	4	1	23
		p	0.0158	0.0137	0.0063	0.0144
		N	91	108	31	230
	2	m	0	1	0	1
		p	–	0.0093	–	0.0043
	3–5	N	62	39	30	131
		m	1	0	0	1
		p	0.0161	–	–	0.0076
		N	1,294	440	221	1,955
Total		m	19	5	1	25
		p	0.0147	0.0014	0.0045	0.0128

b. Nagasaki

Father's Exposure			Mother's Exposure 1	2	3–5	Total
		N	1,481	670	98	2,249
	1	m	25	7	1	33
		p	0.0169	0.0104	0.0102	0.0147
		N	204	286	23	513
	2	m	3	4	0	7
		p	0.0147	0.0140	–	0.0136
	3–5	N	21	30	13	64
		m	0	0	1	1
		p	–	–	0.0769	0.0156
		N	1,706	986	134	2,826
Total		m	28	11	2	41
		p	0.0164	0.0112	0.0149	0.0145

efficients are both negative in sign although neither is significantly different from zero. The surprise with which one greets this failure to demonstrate significant differences among the exposure groups will be in part a function of whether one views natural selection as primarily favoring homozygotes or heterozygotes. At the present time such is the paucity of data on man that one can defend either of these alternatives with equal vigor. In this connection,

Neel[6] has recently presented evidence which can be interpreted as suggesting that some congenital malformations in man may represent the phenodeviants from balanced homeostatic systems. There may, then, be no contradiction between the apparent effect of parental exposure on the sex ratio, and the failure to observe an effect of parental exposure on the frequency of congenital defects.

Table 4 presents the distribution, by city of birth and parental exposure, of

Table 4—The Distribution by City of Birth and Parental Exposure of Infants Dying in the Perinatal Period Born to Parents Who Were Biologically Related

a. Hiroshima

			Mother's Exposure 1	2	3–5	Total
Father's Exposure	1	N	1,123	289	159	1,571
		d	48	15	4	67
		p	0.0427	0.0519	0.0252	0.0426
	2	N	91	107	31	229
		d	4	3	4	11
		p	0.0440	0.0280	0.1290	0.0480
	3–5	N	61	39	30	130
		d	2	8	2	12
		p	0.0328	0.2051	0.0667	0.0923
Total		N	1,275	435	220	1,930
		d	54	26	10	90
		p	0.0424	0.0598	0.0455	0.0466

b. Nagasaki

			Mother's Exposure 1	2	3–5	Total
Father's Exposure	1	N	1,456	663	97	2,216
		d	41	22	1	64
		p	0.0282	0.0332	0.0103	0.0289
	2	N	201	282	23	506
		d	8	3	0	11
		p	0.0398	0.0106	–	0.0217
	3–5	N	21	30	12	63
		d	0	1	0	1
		p	–	0.0333	–	0.0159
Total		N	1,678	975	132	2,785
		d	49	26	1	76
		p	0.0292	0.0267	0.0076	0.0273

infants dying in the perinatal period. It is worth emphasizing that perinatal deaths include those pregnancies terminating after 21 weeks of gestation in a stillborn infant or a child failing to survive the first week of life, and where the child in question did not have a visible, gross abnormality. The elimination of stillborn children or those dying in the first seven days of life with known abnormality precludes the possibility of measuring any genetic damage twice, a situation which might otherwise prevail in view of the high probability that a grossly deformed child will be either stillborn or succumb in the first week of life.

On inspection, the most striking aspect of Table 4 is the apparent heterogeneity between cities. One not only observes a fairly marked difference in perinatal death rates in the two cities, but the increase in mortality with parental exposure which seems to occur in Hiroshima is countered by a decreasing mortality with increasing exposure in Nagasaki. Analysis of these data readily confirms that the heterogeneity is significant. When these data are explored further, one finds that the differences between the nine exposure groups in Nagasaki are not significant whereas in Hiroshima the groups are significantly different. However, when the model previously described is fitted to the Hiroshima data, one finds that though the regression removes a significant amount of variation the variation not removed by the regression is also significantly large. In short, the linear model would appear inadequate to account for more than a small fraction of the observed variation. Interesting too, is the finding that on the linear model the regression coefficients associated with mother's exposure and father's exposure differ in sign. In most circles, the latter would not be considered consistent with our present knowledge of genetic damage following parental radiation. It must be borne in mind that these seemingly anomalous findings may be due to confounded concomitant variation. Unfortunately, such is the paucity of data that it seems unlikely that uncontrolled concomitant variation can be satisfactorily removed. To briefly summarize the findings, there is no demonstrable, consistent effect of parental exposure on the frequency of malformed infants or perinatal deaths among the children born to related parents.

Before we examine the conclusions which seem justified from these data, permit us to restate, for comparative purposes, the findings with reference to the frequency of congenital malformations and of perinatal mortality obtained from the study of offspring of unrelated parents. These were as follows[1]: "Analysis of the frequency of malformed infants by city and parental exposure reveals no significant, consistent effect of parental exposure." "Analysis of the stillbirth data fails to reveal significant differences between cities or consistent significant effects of parental exposure." Finally, "No consistent, significant effect of parental exposure on neonatal mortality emerges from the data obtained in Hiroshima and Nagasaki on deaths occurring in the first six days post partum." The present findings are not, then, at variance with those previously reported for pregnancy terminations to unrelated parents.

What now are the conclusions which we can draw from these data? Can we assert that no genetic damage has accrued from exposure of the populations of Hiroshima and Nagasaki to ionizing radiations? The answer to this question is "no" since it can easily be shown that, with the present numbers, the differences which would have to obtain among exposure groups for significance to result are considerably larger than those expected on a genetic basis. This body of data does not, then, afford an adequate test of the genetic hypothesis. In much the same fashion, one is led to the con-

clusion that these data do not afford a very sharp test of the basic premise that inbred children because of their increased homozygosity are a more sensitive indicator of radiation induced genetic damage than noninbred children since a several-fold difference in response between these groups could go undetected. Must we conclude, then, that these data contribute little, if anything to our understanding of the genetic hazards of ionizing radiation in man? Fortunately no; in point of fact, each "negative" study serves to further isolate the "critical range," that is, that area wherein we must search for genetic differences. A corollary of this would be that each "negative" study further refines the experimental design from which we may ultimately answer our basic problem. Advances in this area of human biology, important and as necessary as they are, will not come easily nor inexpensively, but they will come. Unhappily, however, we are called upon even now to make decisions regarding "permissible doses." These decisions can affect not only the practice of medicine in this country but our national safety as well. Our thinking on these matters is not aided either by those who with head in sand deny the existence of a danger nor those who see in each new increment of fallout x new monsters. Wisdom would certainly dictate that in so far as is consistent with national defense and the sagacious practice of medicine we should keep at a minimum the exposures to which we are subject.

While it may seem that in these closing comments we have strayed somewhat afield from our objective of indicating the similarity of approaches in epidemiology and in population genetics, this is really not so. In both areas, we are frequently confronted with problems of such moment that objectivity is difficult to attain. Yet only in an atmosphere of impartiality can we hope to sort fact from fancy, be this with reference to smoking and lung cancer, or ionizing radiation and our "load of mutations."

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This is an epidemiological study of coronary heart disease in a general population in North Dakota. A number of provocative findings appear in this preliminary report. Among them is the differential risk of developing coronary disease as between farmers and other occupational groups, and the role of factors other than diet in determining the development of the condition.

A SHORT-TERM COMMUNITY STUDY OF THE EPIDEMIOLOGY OF CORONARY HEART DISEASE

A PRELIMINARY REPORT ON THE NORTH DAKOTA STUDY

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THIS REPORT will describe an epidemiological study of coronary heart disease (CHD) in a general population of 106,000 individuals living in six counties of northeastern North Dakota. The study was undertaken in September, 1956, by the North Dakota State Department of Health, physicians of the Grand Forks and Devils Lake District Medical Societies, the North Dakota State Heart Association, and the Heart Disease Control Program of the U. S. Public Health Service.

Objectives of the study were primarily threefold: First, to determine the feasibility of studying the epidemiology of CHD in a general population by using the pooled experience of practicing physicians to identify new occurrences of the disease in the population receiving medical attention. Second, to compare the incidence of such diagnosed CHD among farmers and among other occupational groups. Mortality data and clinical impressions have suggested that a difference exists. Third, to determine, by interview methods, the characteristics of persons developing CHD as contrasted with the characteristics of the general population.

Methods

The Heart Disease Control Program of the Public Health Service undertook to explore a combined retrospective and prospective method of studying the epidemiology of CHD in a general rural population. The six-county area around Grand Forks, N. D., was chosen as the site for the study.* Important reasons for selecting this region were:

1. The population had a natural focal point of medical care within its geographic area increasing the likelihood of identifying cases that developed in the population.

* Grand Forks, Cavalier, Ramsey, Pembina, Walsh, and Nelson Counties.

2. The general level of medical practice was fairly high, increasing the likelihood that physicians would be recognizing new occurrences of coronary heart disease among persons seeking medical attention.

3. The State Health Department personnel had close working relationships with the practicing physicians throughout the six-county area.

4. Preliminary discussions with officers of the Grand Forks District Medical Society revealed that the practicing physicians might be interested in the proposed study.

A study plan was endorsed by the two district medical societies whose physicians served the population of the six-county area. Three internists were appointed to guide the study. The plan of study that was approved was the following: All patients with new or recurring manifestations of CHD seen by physicians in their practice over a period of one year from the start of the study were to be reported on special forms to the study center in Grand Forks. The physicians agreed to provide basic information on each patient including clinical and electrocardiographic findings to the extent available. Diagnostic categories of CHD were defined to be angina pectoris, coronary insufficiency, myocardial infarction and sudden deaths definitely or probably due to coronary heart disease. Other cardiac manifestations such as arrhythmias and congestive heart failure were to be reported if of possible coronary etiology.

Dr. Paul Dudley White made a special visit to speak to the physicians of the area expressing his interest in the study and discussing the diagnosis and epidemiology of CHD. Although only 83 physicians were listed as practicing in the six-county area, over 100 physicians turned up for Dr. White's breakfast meeting, some coming from counties not included in the study.

A medical officer from the Heart Disease Control Program of the Public Health Service was assigned to the North Dakota State Department of Health to carry out the study, under the guidance of the Advisory Committee appointed by the medical societies. Approximately monthly visits to every physician in the six-county area were simultaneously initiated with the reporting system. Physicians in areas bordering the six counties were visited on a bimonthly basis. This not only provided the physicians with specific information about the study but also allowed an opportunity to get details of clinical histories and electrocardiograms for review and classification by the central study group.

Additional sources of information utilized were: hospitals, osteopaths, registrars of vital statistics, morticians, coroners, public health nurses, chiropractors, and newspapers. A 24-hour autopsy service was also offered to physicians in outlying areas to help in the diagnosis of deaths of unknown cause. Gross and microscopical study of the hearts were made in the pathology department of the medical school in Grand Forks.

A special health survey was carried out by the Bureau of the Census in November, 1956, to define the general characteristics of the population within which the coronary cases would be occurring. The survey consisted of an enumeration of persons living in dwelling units falling in an area probability sample of all dwelling units in the six counties. Males 35 years of age and over living in these dwelling units were interviewed for personal characteristics, work history, food habits, cigarette smoking, illness, medical care, health symptoms, and characteristics of the parents. About 10 per cent of all occupied dwelling units in the area fell in the sample. An enumeration was obtained in 94.7 per cent of these units, resulting in identification of 1,886 males 35 years of age and over. Three hundred and eighty-two of these males were reinterviewed during the year of study when selected as matched controls for

cases of coronary heart disease that developed in the population. The cohort of 1,886 males with defined characteristics will be followed for their subsequent clinical and mortality experience with special emphasis on coronary heart disease. This will provide a check on the observations made during the year of study.

Since an important focus of the study pertained to dietary assessment, a dietitian who had lived and worked in the area was given further training in interviewing technics and carried out all subsequent interviews of coronary cases and their controls.* An attempt was made to obtain interviews on all diagnosed coronary cases among males 35 and over as they were reported. For each coronary case two age-matched controls selected at random from the probability sample of males identified in the census were also interviewed. These interviews consisted of first administering an interview schedule nearly identical with that used in the census health survey and second, obtaining a detailed dietary history.

Special emphasis was given to try to establish the usual dietary intake of the coronary cases for the four weeks prior to the coronary event. For the control males it was the four weeks immediately preceding the date of the interview. If the coronary case did not survive, the wife or nearest of kin was interviewed. Likewise the wife or nearest of kin of the matched controls was interviewed in this instance.

As an introduction to the dietary interview a typical meal pattern was asked for as a rough check against the foods reported eaten during the four-week period. The diet history was obtained by means of a comprehensive check list of approximately 135 foods commonly eaten in the United States including special items pertinent to the area such as Scandinavian dishes. Any food items reported which were not on the list were written in by the interviewer. The person was asked whether he had eaten these individual foods during the four-week period, approximately how often, and the size of the portions usually eaten. Special attempts were made to find out the kind of fat used on the food or in its preparation. Often the wife or person responsible for the food preparation was consulted for further specific information. Foods eaten between meals, including alcoholic beverages, were also recorded. A daily average intake based on this four-week record was calculated for total calories, animal and vegetable protein and fat, carbohydrate, cholesterol, total saturated fat, total unsaturated fat, three essential fatty acids, three minerals, and five vitamins.

Preliminary Results

The basic plan of study required considerable planning and work, but was completed without major difficulty. The health survey generally received good cooperation once the interviewers identified themselves as being with the U. S. Bureau of the Census making a health survey. Of the 1,886 males enumerated, an interview was obtained for all but 31. Thirteen of these males refused to be interviewed and the 18 others could not be located or had a health or a language difficulty.†

From the total population of approximately 20,000 males 35 years of age and over, 228 cases considered by the review committee to be CHD developed during the year of study. It is probable that certain cases produced by the population

* For details of the dietary study, see A. P. Meredith. "Diet in Relation to Coronary Heart Disease—North Dakota Study." (To be published.)

† Further information on the health survey appears in: Enterline, Philip, and Capt, Katherine G. A Validation of Information Provided by Household Respondents in Health Surveys. A.J.P.H. 49, 2:205 (Feb.), 1959.

were missed, both because not all individuals developing symptoms of the disease would seek medical attention and because of those seeking medical attention not all cases of the disease would be recognized. Moreover, about 7 per cent of the population spends a month or more out of the six-county area each year. Thus, the nonfatal events that may have occurred during this absence would be missed if the individual did not report his illness to his physician after returning to the area.

Identification of the more severe cases of CHD, such as myocardial infarction and deaths, is believed to have been reasonably complete. The thoroughness with which sources, in addition to direct physician reporting, were checked helped to assure this identification.

Shown in Table 1 are the diagnosis of 228 cases reported among males age 35 and over, and considered to be CHD by the committee of internists appointed to guide the study. Of these 228 coronary cases, 160 occurred in males with no previously diagnosed manifestations of CHD. Of these 160 cases, 25 were considered to be angina pectoris, 31 to be coronary insufficiency, 72 to be myocardial infarction, 22 were sudden deaths considered to be attributable to CHD, four were sudden deaths possibly due to CHD, and the remaining six had other manifestations or were not classified.

Of the total of 228 cases classified as CHD, 101 occurred among farmers and 127 among males of other occupations. Tables 2 and 3 show the reported annual incidence rates for coronary heart disease among farmers and among all other

Table 1—Reported Cases of Coronary Heart Disease Among Males 35 Years of Age and Over Diagnosed as Coronary Heart Disease by Review Committee Showing Manifestations of Coronary Heart Disease Previously Diagnosed, Six-County Area of North Dakota, 1957

Diagnosis Made by Review Committee	Total	Without Previous Manifestations of CHD	Previously Diagnosed Manifestations of CHD				
			Total	Angina Pectoris	Coronary Insufficiency	Myocardial Infarction	Congestive Failure
All coronary heart disease	228,	160	68	19	8	33	8
Angina pectoris	28	25	3	2	–	–	1
Coronary insufficiency	42	31	11	1	3	6	1
Definite	37	28	9	1	2	5	1
Probable	5	3	2		1	1	
Myocardial infarction	101	72	29	9	3	15	2
Definite	77	53	24	6	2	14	2
Probable	24	19	5	3	1	1	–
Sudden death definite coronary	11	8	3	1	–	2	–
Sudden death probable coronary	27	14	13	4	1	6	2
Sudden death possible coronary	5	4	1	–	–	1	–
Other manifestations of coronary disease*	14	6	8	2	1	3	2

* Includes 12 cases of congestive heart failure and 2 cases not classified by review committee.

Table 2—Incidence of Coronary Heart Disease With or Without Previous Manifestations Among Farmers and Other Occupations by Diagnosis, Six-County Area of North Dakota, 1957

Diagnosis Made by Review Committee	Farmers		Others*	
	No. of Cases	Rate per 1,000	No. of Cases	Rate per 1,000
All coronary heart disease	101	9.60	127	13.64
Angina pectoris	19	1.81	9	0.97
Coronary insufficiency	20	1.90	22	2.36
Myocardial infarction	42	3.99	59	6.34
Definite	27	2.57	50	5.37
Probable	15	1.42	9	0.97
Coronary occlusion†	13	1.24	25	2.69
Other coronary disease	7	0.67	12	1.29

* Includes six occupations unknown.
† Sudden deaths definitely or probably due to coronary disease. Sudden deaths are those not seen by a physician immediately prior to death.

occupations. The reported incidence of milder manifestations of CHD, such as angina pectoris and coronary insufficiency when combined, was not much different for farmers when compared with nonfarmers. The incidence of the more severe manifestations of CHD, myocardial infarction and death, was twice as high among other occupational groups as among farmers. This difference persists at every decade as is shown in Table 3. Information on occupation proved to be fairly reliable and did not tend to be affected by the development of CHD.*

The difference in incidence could reflect some underreporting for farmers or overreporting for others.† However, the fact that the death rate for CHD, as defined by the review committee, was appreciably lower among farmers than in others suggests that a real difference in the incidence of CHD exists.

Table 4 summarizes information obtained on the relationship between cigarette smoking and coronary heart disease. After adjusting for age differences between smokers and nonsmokers, the reported incidence of coronary disease was over twice as high (6.2 vs. 2.8) among cigarette smokers as among persons who had never smoked.‡ A difference was observed in every age group. There is no reason to believe that smokers with CHD would be any more likely to be diagnosed than nonsmokers. On the health survey, smokers reported seeing physicians about as frequently as nonsmokers. The smoking questions used proved to be quite reliable when meas-

* There was 92 per cent agreement for 317 males in the health survey for whom information on occupation was obtained twice. Twenty males interviewed in the health survey who subsequently developed CHD in 1957 reported the same information on occupation as was given by them on the health survey in November, 1956.

† The health survey revealed that farmers tended to utilize medical facilities to a somewhat lesser extent than did persons in other occupations. Eighty-six per cent of farmers with chronic conditions reported had seen a doctor about them, whereas 91 per cent of the nonfarmers with chronic conditions had seen a doctor.

‡ The total population of males was used as the standard for age-adjusting.

ured by the reproducibility of the information given.*

The relationship between cigarette smoking and CHD among farmers and other occupational groups is shown in Table 5. No appreciable difference in incidence of coronary disease was present among farmers who smoked and farmers who did not smoke (3.4 vs. 2.7). However, among other occupations as a group, the incidence of CHD was twice as high among smokers as among nonsmokers (7.8 vs. 3.5). If cigarette smoking is a factor in CHD, possibly the lack of association among farmers was due to the fact that the farmers who smoked cigarettes smoked less than males in other occupational groups.†

A detailed dietary history was obtained for 162 of the 228 CHD cases reported. For 20 deaths there was no one from whom this information could be obtained, four persons refused interview, and for 42 the information obtained was not considered by the dietitian-interviewer to be satisfactory—either because it was incomplete (39 cases) or because she felt the person being interviewed was not supplying accurate information (three cases). A comparison of the 162 cases for whom satisfactory information was obtained with their 324 controls is shown in Table 6.‡

* There was an 88 per cent agreement for the categories shown in Table 4 for 352 men for whom replicate smoking histories were obtained. Also, there was no great tendency for the reporting of smoking histories to be any different after CHD had been diagnosed than before. Of the 20 persons interviewed before and after their diagnosis, 17 provided the same information in the categories shown in Table 4, two moved from the "never smoked" to the "did not now" category, and one moved from the "smoking now" to the "did not now" category.

† The health survey revealed that only 7 per cent of the farmers who were smoking cigarettes at the time of the survey smoked over a pack of cigarettes a day, whereas 18 per cent of those in the other occupational groups who were smoking smoked over a pack of cigarettes a day.

‡ Only those males who have no history of CHD and who had no symptoms which would suggest the presence of CHD were considered eligible for selection as controls.

Table 3—Incidence of Coronary Heart Disease Among Farmers and Other Occupations by Age, Six-County Area of North Dakota, 1957

Age	Usual Occupation	Estimated Population	CHD Without Previous Manifestations		Infarctions or Occlusions Without Previous Manifestations	
			No.	Rate per 1,000	No.	Rate per 1,000
All ages	Farmers	10,520	70	6.65	38	3.61
	Others	9,310	90	9.67	56	6.02
35–44	Farmers	2,720	3	1.10	1	0.37
	Others	3,010	11	3.65	6	1.99
45–54	Farmers	2,880	11	3.82	8	2.78
	Others	2,440	15	6.15	13	5.33
55–64	Farmers	2,480	26	10.48	12	4.84
	Others	1,830	21	11.48	13	7.10
65–74	Farmers	1,760	19	10.80	12	6.82
	Others	1,360	29	21.32	16	11.76
75+	Farmers	680	11	16.18	5	7.35
	Others	670	14	20.90	8	11.94

Table 4—Incidence of Myocardial Infarction or Coronary Occlusion for Persons Without Previously Diagnosed Manifestations of Coronary Heart Disease by Cigarette Smoking History and Age, Six-County Area of North Dakota, 1957

Age Group	Never Smoked			Did Smoke—Not Now*			Smoking Now*			Smoking Status Unknown	
	Estimated Population	No. of Cases	Per 1,000	Estimated Population	No. of Cases	Per 1,000	Estimated Population	No. of Cases	Per 1,000	Estimated Population	No. of. Cases†
All ages	7,950	30	3.8	2,270	7	3.1	9,190	40	4.4	420	17
35–44	1,300	0	0.0	680	0	0.0	3,680	7	1.9	70	0
45–54	1,570	3	1.9	750	4	5.3	2,970	13	4.4	30	1
55–64	2,050	9	4.4	520	1	1.9	1,700	9	5.3	40	6
65–74	2,020	10	5.0	260	2	7.7	790	10	12.7	50	6
75+	1,010	8	7.9	60	0	0.0	50	1	20.0	230	4
Age Adjusted Rate			2.8			3.0			6.2		

* For cases this refers to just prior to the attack.

† Thirteen deaths without survivors available for interview and four refusals.

Table 5—Incidence of Myocardial Infarction or Coronary Occlusion for Persons Without Previously Diagnosed Manifestations of Coronary Heart Disease by Occupation, Cigarette Smoking History, and Age, Six-County Area of North Dakota, 1957*

Age Group	Farmers†						Others‡					
	Not Smoking			Smoking Now			Not Smoking			Smoking Now		
	Estimated Population	No. of Cases	Per 1,000	Estimated Population	No. of Cases	Per 1,000	Estimated Population	No. of Cases	Per 1,000	Estimated Population	No. of Cases	Per 1,000
All Ages	6,370	21	3.3	4,130	12	2.9	3,850	16	4.2	5,060	28	5.5
35–44	1,170	–	–	1,550	1	0.6	810	–	–	2,130	6	2.8
45–54	1,480	3	2.0	1,400	4	2.9	840	4	4.8	1,570	9	5.7
55–64	1,710	8	4.7	760	2	2.6	860	2	2.3	940	7	7.4
65–74	1,340	6	4.5	410	5	12.2	940	6	6.4	380	5	13.2
75+	670	4	6.0	10	–	–	400	4	10.0	40	1	25.0
Age Adjusted Rate			2.7			3.4			3.5			7.8

* Excludes population with unknown smoking history. † Excludes five cases with unknown smoking history.

‡ Excludes 12 cases with unknown smoking history. Includes four cases with occupation unknown.

Information is shown separately for four groups of cases. Regardless of how the cases were defined, no difference in the calculated mean daily intake of dietary components could be detected. Dietary components analyzed for included calories, fat, per cent of calories from fat, per cent of total fat made up of animal fat, per cent of total fat made up of saturated fatty acids, ratio of unsaturated fatty acids to saturated fatty acids, ratio of linoleic acid to saturated fatty acids and per cent of calories from protein. A lack of relationship between mean fat intake and CHD is also suggested from the health survey information.*

Does the coronary event influence the views of the coronary case toward his previous eating habits? There is some evidence from replicate interviews that the males considered their usual fat intake to be greater after their CHD was diagnosed than before.†

A comparison is being made of the specific kinds and amounts of foods eaten by coronary cases as contrasted with controls. This will provide a further check on the dietary habits of the coronary and control groups.

Preliminary data are also available on the relationship between physical activity characteristics and CHD. Men whose usual occupation required no heavy physical work had an incidence rate over three times as high as those whose usual occupation required some heavy physical work. Unfortunately, interview information on physical activity appeared to be very unreliable. Dividing hours of heavy physical work into 0, 1-6, and 7 or more, only a 51 per cent agreement was found for 273 men for whom replicate information was obtained. Moreover, there was a tendency for men to report less heavy physical work in their usual occupation after their coronary attack than before. The relationship of physical activity to CHD will warrant considerable additional study.

Discussion

Experience gained from this study indicates that epidemiological studies of general populations can be carried out in conjunction with interested practicing physicians over a period of a year with reasonable success. Only one aspect of the procedure could not be checked on directly—the extent to which nonfatal CHD was underreported. Considering the careful checking of hospital and other records in the area, however, this possible underreporting probably does not seriously affect the relationships observed.

Despite the limitations of the tools and procedures used in this study some provocative findings have been produced. There appears to be a real difference in risk of developing severe manifestations of CHD for farmers as contrasted with other occupations as a group. The explanation for this difference deserves more intensive study.

Some comments should be made on the lack of apparent differences in recent dietary patterns of coronary cases in comparison with controls. This does not necessarily mean that dietary factors

* In the health survey an abbreviated dietary interview was obtained dealing with common foods known to be high in fat content. Of the estimated population reporting under 100 grams of daily fat intake on the health survey the incidence of new CHD was 6.9 per 1,000 while those reporting over 150 grams of daily fat intake had about the same rate, 7.4 per 1,000. Information obtained on the dietary interview used on the health survey was not entirely reliable, however. For 352 persons for whom information was obtained twice using this interview form, the correlation coefficient between the average daily grams of fat reported for each person was only 0.5.

† For 20 persons from whom abbreviated dietary information was obtained before and after they had developed CHD the mean grams reported on the first interview was 101 and on the second was 112.

Table 6—Comparison of Diets Between Cases and Controls by Diagnosis Made by Review Committee, Six-County Area of North Dakota, 1957

Diet	All Coronary Disease				Cases Without a Previously Diagnosed Manifestation of Coronary Heart Disease				All Myocardial Infarctions or Coronary Occlusions				Myocardial Infarctions or Coronary Occlusions Without a Previously Diagnosed Manifestation of CHD			
	Cases (n=162)		Controls (n=324)		Cases (n=117)		Controls (n=234)		Cases (n=94)		Controls (n=188)		Cases (n=64)		Controls (n=128)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Cases		Controls		Cases		Controls	
Calories per day	2,831	1,006	2,782	817	2,961	1,046	2,819	810	2,750	1,032	2,792	828	2,905	1,085	2,819	814
Grams of fat per day	141	55	140	46	149	57	142	46	135	56	141	46	143	57	143	46
Per cent of calories from fat	44.8	4.9	45.3	5.1	45.3	4.9	45.3	5.1	44.2	4.9	45.5	5.0	44.3	4.7	45.7	5.1
Per cent of total fat made up of saturated fatty acids	41.8	4.7	41.8	4.7	41.7	4.2	42.0	4.3	41.9	4.9	42.1	5.0	41.6	4.0	42.4	4.4
Ratio of unsaturated fatty acids to saturated fatty acids	1.22	0.22	1.19	0.23	1.22	0.23	1.24	0.23	1.23	0.25	1.23	0.25	1.23	0.25	1.23	0.25
Ratio of linoleic acid to saturated fatty acids	0.19	0.07	0.19	0.09	0.19	0.07	0.18	0.08	0.20	0.07	0.19	0.09	0.20	0.07	0.19	0.09
Per cent of calories from protein	15.2	2.4	15.0	2.4	15.0	2.2	15.1	2.5	15.1	2.5	14.9	2.5	14.8	2.0	15.0	2.6
Per cent of total fat made up of animal fat	84.8	9.7	86.2	9.4	85.2	9.5	86.4	9.1	84.2	10.5	86.6	9.9	84.6	10.3	86.6	10.3

S.D.—Standard Deviation around mean.

may not be important in the development of coronary heart disease. Mean dietary intake will have to be assessed in relation to height-weight-activity characteristics. Even this may not reveal differences between coronary cases and controls since the fat consumption in the population studied was surprisingly uniform. As is shown in Table 6, the calories from fat ranged only between 40 and 50 per cent in two-thirds of the men studied. Under such conditions, considering the potential inherent error in dietary interview procedures, it seems unlikely that any relationship between diet and CHD can be established. These dietary findings suggest the probable importance of factors other than diet in determining why, in populations on relatively high fat diets, some males develop CHD and others do not.

Summary

An epidemiological study of coronary heart disease in a general population of 106,000 individuals was carried out over a period of one year.

Information on all persons with new or recurring manifestations of CHD seen by physicians in their practice over this period was obtained by monthly visits to all physicians practicing in the defined area.

Males 35 years of age or over reported as cases, or their survivors, were interviewed for characteristics of possible importance in the development of CHD. A probability sample from the general population of males of the same age was also interviewed for the same characteristics.

The study method employed appears to have promise and with further refinements could contribute to a greater understanding of the epidemiology of CHD.

Initial findings in 228 males 35 years of age and over considered to be CHD cases by a review committee of internists show that a lower incidence of CHD occurred in farmers than in males in other occupational groups; that there was a higher incidence of CHD in cigarette smokers than nonsmokers; and that lack of physical activity was also probably related to CHD. Comparison of recent dietary histories of cases and controls revealed no differences in mean caloric intake, total fat consumption, or other major dietary constituents.

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Dr. Zukel, Dr. Lewis, Mr. Enterline, and Miss Meredith were associated with the Heart Disease Control Program, Public Health Service, Washington, D. C., at the time of this study. Drs. Painter and Ralston are internists in Grand Forks, N. D., Dr. Fawcett is an internist in Devil's Lake, N. D. Miss Peterson was a dietitian on the staff of the North Dakota State Health Department.

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It is difficult to establish the effect of active infection and vaccination on antibody level in a population due to the wide prevalence of polioviruses and antibody. This study compares two methods for evaluating antibody response.

A COMPARISON OF COMPLEMENT FIXATION AND METABOLISM INHIBITION AS METHODS OF EVALUATING POLIOMYELITIS ANTIBODY RESPONSE

David Lackman, Ph.D., F.A.P.H.A.; Robert Gerloff, M.A.; and Robert Philip, M.D.

BECAUSE OF THE WIDESPREAD prevalence of poliomyelitis viruses and antibody, the influence of vaccination and active infection on antibody level in a population is difficult to determine. From an investigation of poliomyelitis on St. Paul Island, Alaska, and from two separate studies evaluating the antibody-stimulating capacity of Salk poliomyelitis vaccine, data were collected with which the significance of changes in amount of neutralizing and complement-fixing antibody could be assessed. These data and conclusions from them are presented here.

Materials and Methods

1. Sera Tested—Seventeen sets of sera were included in this survey. For ease of evaluation they are grouped as follows: sera from Alaska collected in 1954 during study of an outbreak of poliomyelitis caused by Type III virus (Table 1); sera from Montana school children (age six to nine years) who were bled during poliomyelitis vaccine trials (Table 2); and sera from Idaho school children (age five to 15 years) who likewise had participated in an evaluation of antibody response to poliomyelitis vaccine (Table 3).

2. Complement-Fixation Test — The plate complement-fixation (CF) test for poliomyelitis described by Black and Melnick[1] was difficult to standardize when used by several operators. Although our CF test followed the same general procedures as that described by Schmidt and Lennette,[2] we reduced the volume of each component per tube from 0.2 ml to 0.05 ml. The latter amount may be measured with a 1.0 ml pipette graduated in 0.01 ml. Because antigens were being used undiluted and because sera had to be conserved for other tests as well, it was important to use minimal amounts of both.

Antigens — The three polioviruses (Type I, Mahoney strain; Type II, MEF-1; and Type III, Saukett) were grown in confluent monolayers of monkey-kidney cells. These cells were maintained in Hanks' balanced salt solution containing 0.5 per cent lactalbumin hydrolysate, 2 per cent calf serum, and 0.2

per cent total sodium bicarbonate. For use as antigen in the CF test tissue culture fluid had to have an infectious titer for homologous cells of at least 10^{-7} per 0.1 ml. The CF titer of such fluids varied from 1:2 to 1:4. In serum titrations they were used undiluted and were not inactivated. Although other investigators[3] have reported that antigens with higher titers could be obtained by using HeLa cells for growth of the virus, our line of HeLa cells yielded CF antigens only half as reactive as those obtained with monkey-kidney cells.

Antisera for Standardizing Antigens—Standard monkey poliomyelitis antisera for use in titrating antigens were obtained from Dr. J. T. Syverton, University of Minnesota. They were prepared for the National Foundation for Infantile Paralysis (NFIP) and were identified by the following numbers: Type I, 5-246; Type II, 5-242; Type III, 5-248. Types I and II sera had a CF titer of 1:256, and Type III of 1:64 against two units of antigen. Types I and III sera were specific, but Type II serum gave some cross-reaction with Type I antigen.

Complement—Commercial, lyophilized complement was used. It was titrated in terms of the amount required to produce 50 per cent hemolysis by the method of Osler, Strauss, and Mayer.[4] Four, 50 per cent units of complement were used in the test. This amount was usually contained in a 1:40 dilution of guinea pig serum and corresponded to four exact units in the Kolmer titration.

Hemolysin—Four units of commercial hemolysin, titrated by the method of Mayer, Eaton, and Heidelberger,[5] were used in each test.

Suspension of Sheep Erythrocytes—Sheep blood was preserved in Alsever's solution. A standardized suspension containing 5 per cent of washed red blood cells was prepared with the aid of a Coleman Junior spectrophotometer according to the method described by Mayer, et al.[5] To sensitize red blood cells, diluted hemolysin (usually a 1:1,600 dilution) was slowly poured with constant mixing into an equal volume of standardized cell suspension. The mixture was then placed in the 37° C water bath for ten minutes.

Procedure for the Test—All reagents were diluted in 0.85 per cent NaCl containing 1 ml per liter of the following solution: 15.5 gm $MgCl_2.6H_2O$ and 8.5 gm $CaCl_2.2H_2O$ in 500 ml of distilled water. All sera were inactivated at 56° C for 30 minutes. Twofold dilutions of

Table 1—Poliomyelitis Antibodies in Alaska, 1954

Group	No. of Specimens	Per cent Positive for Antibody to Poliotype: I CF*	I MI*	II CF	II MI	III CF	III MI
A	82	18	2	52	1	85	96
B	89	0	0	3	1	8	99
C	50	8	0	4	30	12	64
D	87	38	73	50	37	54	38

* CF = complement fixation; MI = metabolism inhibition
A. St. Paul Island, children, 16 years of age and under, bled in February, 1954, one month following an outbreak of Type III poliomyelitis.
B. The same group of children bled seven months later in September, 1954.
C. Adults on St. Paul Island bled in September, 1954.
D. Miscellaneous sera from Anchorage and Seward, Alaska, September, 1954, for comparison with St. Paul sera.

Table 2—Poliomyelitis Antibodies in Montana Children

Group	No. of Specimens	Per cent Positive for Antibody to Poliotype: I CF	I MI	II CF	II MI	III CF	III MI
A	251	9	45	15	36	13	27
B	208	10	50	20	34	22	27
C	250	13	53	24	62	25	41
D	225	19	67	32	82	36	60
E	75	15	52	5	63	11	47
F	282	25	68	12	84	8	61
G	71	14	65	25	69	23	56
H	53	23	96	32	92	40	92

A. School children, age zero to 12 years, Hamilton, Mont., February-March, 1955, before poliomyelitis vaccination.
B. Montana children, age six to nine, unvaccinated, July-August, 1955.
C. Children comparable to Group B, but 25-35 days following first injection of poliomyelitis vaccine.
D. Children comparable to Group C, but 28-31 days after the second injection of vaccine.
E. Children comparable to Group C, bled in 1956 before a third dose of vaccine.
F. Children comparable to Group C, but six weeks after receiving the third dose of vaccine.
G. Montana children who received three doses in the 1954 trials, two weeks following a fourth dose of vaccine in 1955.
H. Children comparable to Group G, but six weeks following the fourth dose of vaccine.

inactivated serum were prepared and 0.05 ml aliquots were transferred to 10 x 75 mm glass tubes to each of which 0.05 ml of antigen and 0.05 ml of complement were then added. The racks of tubes were shaken and were stored at 6° C for 16-18 hours for fixation to take place. Cell, antigen, and serum controls were included in each test. The hemolytic system control, in duplicate for each test, consisted of tubes containing four, two, and one hemolytic units (50 per cent) of complement.

Following the fixation period, 0.05 ml of sensitized cell suspension was added to each tube and the racks were again shaken. After incubation for 30 minutes at 37° C, the tests were read. Fixation was estimated according to the amount of unhemolyzed cells remaining in the bottom of each tube and was recorded as 4+, 3+, 2+, 1+, or 0 fixation. The titer of antigen or serum was considered to be the dilution giving at least 2+ fixation. Serum titers of 1:16 or greater were considered positive.

3. Metabolic Inhibition Test in Tissue Culture—Neutralizing antibody against poliovirus was measured by a metabolic inhibition (MI) type of test similar to one described by Salk, et al.[6] Trypsinized monkey-kidney cells were prepared by a method closely resembling that of Rappaport.[7] The highest dilution of serum which protected these cells against 100-300 infectious doses of virus ($TCID_{50}$) sufficiently to permit decrease in pH to 7.0 or below was considered the antibody titer of that serum. Tests of sera collected early in this study were performed in glass tubes; those collected later were tested in cups of disposable plastic panels[8] sterilized by ultraviolet irradiation. Nutrient fluid consisted of Hanks' balanced salt solution containing 0.5 per cent lactalbumin hydrolysate and 2 per cent horse serum. The mixture of serum, virus, cells, and nutrient fluid in each cup of the panel was overlaid with an equal quantity of mineral oil. Each panel was then covered with a sheet of sterile aluminum foil and incubated at

36° C for ten to 12 days as determined by behavior of the controls.

Each test was accompanied by virus and cell titrations, plus controls on serum toxicity, virus dilution, cell dilution, and reproducibility of titers of a single serum in tests of different dates. Serum titers of 1:16 or greater were considered positive.

4. Statistical Method—Differences in rates were evaluated for significance according to a method outlined in Batson's statistical manual.[9] The standard error of the difference was determined and the ratio between this and the difference was calculated. The value obtained was essentially comparable to "the ratio of the difference between two means to the standard deviation of the difference" and a table of t may be used for assessing the significance of the ratio obtained. For this study a value of p equal to or less than 0.001 was selected as indicative of a significant difference between rates.

Results

The clinical and epidemiologic history of the Type III poliomyelitis outbreak on St. Paul Island was reported previously by Eklund and Larson.[10] The results of our serologic tests are given in Table 1. Although poliovirus other than Type III was apparently not active, an increased level of Types I and II CF antibody was also noted. MI antibody was specific since its level increased only because of an increased prevalence of Type III virus following the outbreak. When the children were bled seven months later, MI antibody was still at the same level but CF antibody had decreased to an insignificant amount. Adults bled at the same time (September, 1954) did not have significant amounts of poliomyelitis CF antibody, but the levels of Types II and III MI antibody indicated past exposure to these two types of virus. The group of individuals from the mainland of Alaska, included as a control group, exhibited an antibody picture more like that obtained with similar groups in the United States.

Montana school children were used in the poliomyelitis vaccine field trials conducted in 1954 by the NFIP and for a special vaccine study in 1955 and 1956.[11] Results of tests on sera from children in the latter study are presented in Table 2.

An evaluation for significance of the differences between rates on specimens from children before vaccination and those taken following a second injection of vaccine (Groups B and D) indicated: (1) a significant difference was not demonstrable between rates for CF anti-

Table 3—Poliomyelitis Antibodies in Idaho Children

Group	No. of Specimens	Per cent Positive for Antibody to Poliotype: I CF	I MI	II CF	II MI	III CF	III MI
A	189	12	38	9	35	8	40
B	212	23	56	22	65	18	44
C	161	9	35	4	58	6	39
D	78	14	79	9	95	11	55

A. Idaho children before vaccination, 1956.
B. Children comparable to Group A, bled one month following first injection of poliomyelitis vaccine.
C. Children comparable to Group B, bled seven months following a second injection of vaccine.
D. Children comparable to Group C, bled four to six weeks following a third dose of vaccine.

body to the three types of poliovirus, (2) there was no significant increase in neutralizing antibody for Type I poliovirus, and (3) a significant increase in MI antibody for Types II and III was demonstrable.

Six weeks after the booster (third) dose of vaccine in 1956 (Group F), prevalence of MI antibody was the same as that found in specimens taken after the second dose (Group D). Statistical evaluation of control groups A and B in comparison with Group F indicated: (1) there was still no significant increase in CF antibody for any of the three types, and (2) the prevalence of Types II and III MI antibody was significantly higher. However, the values obtained were not higher than those following the second injection of vaccine (Group D). Type I MI antibody was increased, but there was not as great a difference because of the relatively high levels in the controls.

The group showing greatest MI antibody response was that composed of children who had received three doses as participants in the field trials of poliomyelitis vaccine conducted by the NFIP in 1954 and who had been given a fourth dose in 1955 (Group H). Statistical evaluation of the differences between these children two weeks following the fourth dose of vaccine (Group G) and four weeks later (Group H) indicated: (1) no significant difference in CF antibody was evident, and (2) a significant increase in prevalence of MI antibody for all three types was noted.

It was also of interest to compare Group H with the control groups (Groups A and B) with respect to CF antibody because it appeared that if any significant increase had occurred as a result of vaccination it would be detected in those children showing greatest stimulation of MI antibody. Increases in CF antibody were evident but, except for Type III, were only on the borderline of significance. However, the percentage of positives in Group H is still comparatively low and could be accounted for by normal exposure to live virus.

A vaccine evaluation study was conducted in Idaho children during 1956.[12] The sera collected from them were available for use in this study; the results are given in Table 3. One month following the first injection of poliomyelitis vaccine significant increase in prevalence of Types I and II MI antibody occurred (Groups A and B compared). There was no significant increase in the prevalence of Type III MI antibody nor of CF antibody for any of the types of poliovirus.

When sera taken seven months following the second dose of vaccine (Group C) were tested, MI antibody for Type II only remained prevalent in a significantly greater number of children. However, several weeks following a third inoculation of vaccine Types I and II MI antibody were again significantly increased in prevalence. Type III antibody still did not increase significantly nor did prevalence of CF antibody alter significantly from that found in the control group (Group A).

During the Idaho study, there was a tendency to select children who were less prone to produce antibody. After parents received a report that their children had poliomyelitis antibody, they usually did not bring them for further inoculations of vaccine. This should be kept in mind in evaluating the data in Table 3. Group D is particularly biased in this respect because it consists for the most part of children who did not have MI antibody after the second injection of vaccine.

Summary and Conclusions

The only group showing increased percentages of individuals with CF antibody to poliovirus was that of the children on St. Paul Island one month following the introduction of living Type

III poliovirus. These antibodies decreased to insignificant levels within the following eight months. This finding suggests that continued or repeated exposure to living polioviruses is necessary to maintain a significant level of CF antibody in a population. This conforms to earlier findings of Melnick, et al.[13] The 1955-1956 study in Montana children was undertaken for the purpose of determining whether living poliovirus was present in the particular lot of vaccine used. Failure to demonstrate an increased prevalence of CF antibody following injection of this vaccine confirms other work[11] showing that this preparation did not contain poliovirus capable of infecting children.

In contrast to the results obtained with CF were those obtained with the MI test for neutralizing antibody. The latter test detected antibody produced as a result of vaccination with formalin-inactivated poliovirus. It also detected antibody caused by infection with living poliovirus for a much longer time than did the CF test. Therefore, the test would be more useful than CF in evaluating the past experience of a population with respect to poliovirus infection or immunization.

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The prevention of accidents continues to be of concern to public health workers. What are the best ways to develop such programs, and how can the results be evaluated? These are basic questions. How they were answered in San Jose is told in the following article.

ACCIDENT CONTROL

A LOCAL HEALTH DEPARTMENT'S EXPERIENCE IN DEVELOPMENT AND EVALUATION OF A HOME ACCIDENT PROGRAM

Dwight Montgomery Bissell, M.D., M.S.P.H., F.A.P.H.A., and Robert S. McInnes, M.P.H.

FOR SEVERAL years the city of San Jose through its health department had been aware of the need for preventing accidents in the motor vehicle field as well as the home accident field. The local chapter of the National Safety Council, the operation of an emergency first aid station as well as an alert and capable health department staff pointed out that deaths and injuries from accidents were an important disease afflicting the community. Our accidental death rate was neither high nor low; in fact it was the average for the state of California. With the aid of a special grant from the Kellogg Foundation we tried through research to find an answer to the question, "How can a local health department develop and carry out a program to prevent home accidents in San Jose—a typical American city of approximately 100,000 people?"

One of the problems which confronted us was that of definitions. Fortunately a national committee has now resolved this problem and there is reasonably uniform agreement on definitions. Our next problem was to find a base line for the determination of the number of accidental injuries occurring so that at the end of the project we might know whether or not our efforts had been effective. We recognized that for several reasons a change in the accidental death rate would not be a very accurate means of determining the effectiveness of our program.

First, it is not always possible to determine whether an "accidental" death is really accidental since a large percentage of these deaths occur among elderly people due to falls. It is often difficult to determine whether the patient had a cerebral vascular accident and fell, or whether the fall might have been due to osteoporosis or some other pathological condition producing a fracture. In the case of ingestion of barbiturates, particularly among adults, a determination whether the death was accidental or suicide is often difficult as death may have sealed the lips of the only person who could give that information.

Second, we were dealing with relatively small numbers of from 12 to 18 cases per year and the fluctuation of two or three deaths in this small number would not be significant.

A third problem is that of coding. If a person with a fractured hip died of

pneumonia shortly after the fracture occurred, it might be charged as an accidental death. If he died of pneumonia a good many months after the fracture occurred, the death might be charged to pneumonia. The cause of death as recorded by physicians will vary, and our data will be as accurate as recording physicians make them. We found variation within a group of public health statisticians who were coding certificates.

Our final conclusion was that death certificates were valuable only as indicators of a trend. Tables 1 and 2 and Figure 1 illustrate the problems mentioned above. I should like to point out how uniform the death rate is from 1950-1957, inclusive, except for 1956, if falls are excluded. There is a slight drop, but it is not remarkable.

Morbidity figures were considered to give us some statistical evaluation of the results of our efforts. A general morbidity survey was in progress in our city about the time we began the home accident prevention program. After these data were collected and analyzed the statisticians finally decided that they too were unreliable due to small numbers and recall factors. The collection of morbidity data seems to present a problem in that injured persons often forget about their injuries. Data will vary even if one uses a self-recording device such as a calendar, personal interviewing or other procedures, unless one has an observer constantly with the patient to see if he has a home accident. The latter procedure is ridiculous of course and obviously impossible. Too great an effort

Table 1—Fatal Home Accidents with and without Mention of Cardiovascular Pathology[1] by Number and Per cent of Total Fatal Home Accidents, by Year—San Jose, 1946-1957

Year	Total	Fatal Home Accidents			
		With Mention of Cardiovascular Pathology		Without Mention of Cardiovascular Pathology	
		Number	Per cent	Number	Per cent
1946	10	2	20.0	8	80.0
1947	19	9	47.4	10	52.6
1948	8	4	50.0	4	50.0
1949	26	10	38.5	16	61.5
1950	20	9	45.0	11	55.0
1951	18	6	33.3	12	66.7
1952	16	6	37.5	10	62.5
1953	18	6	33.3	12	66.7
1954	23	9	39.1	14	60.9
1955	12	5	41.7	7	58.3
1956	8	3	37.5	5	62.5
1957	15	3	20.0	12	80.0
Total	193	72	37.3	121	62.7

1. Cardiovascular pathology—includes any condition mentioned on the death certificate which may be coded to 330-334, 410-416, 420.0-422.2, 430.0-434.4, 440-447, 450.0-456, 460-468 of I.S.C. Code. (Source: San Jose City Health Department, Mortality Records, September 15, 1958.)

Table 2—Total Fatal Home Accidents and Fatal Home Accidents Due to Falls by Number and Rate (per 100,000 Estimated Population)—San Jose, 1946-1957

Year	Fatal Home Accidents		Fatal Home Accidents Due to Falls	
	Number	Rate	Number	Rate
1946	10	12.3	5	6.2
1947	19	22.4	11	12.9
1948	8	9.2	6	6.9
1949	26	28.4	15	16.4
1950	20	20.8	13	13.6
1951	18	18.3	11	11.2
1952	16	15.8	9	8.9
1953	18	17.3	12	11.5
1954	23	21.5	16	15.0
1955	12	10.5	6	5.3
1956	8	6.4	6	4.8
1957	15	11.3	8	6.0

(Source: San Jose City Health Department, Mortality Records, September 15, 1958.)

to collect morbidity data will make the patient conscious of the need for preventing home accidents and consequently lessens his value as a typical random sample of the total population.

Consequently, we began to look at the problem of evaluation in a slightly less orthodox fashion. We realized that we were dealing with a sociological and psychological problem which was practically impossible to reduce to the comfortable realm of numbers which are usually satisfying to mathematicians. In the course of our project we had brought together a large number of community organizations interested in home safety, as well as hundreds of individuals who had participated or had been influenced by the program. Letters were sent to the organizations asking them to say whether they felt that their experience with the home safety project had been worth while or useless, and to be as specific as possible in replying. They were told that we were not asking for compliments but wanted from them a true, accurate opinion of the program's strength and weaknesses. These letters were published verbatim in our five-year report entitled "San Jose Home Safety Project."

Another part of the evaluation which we considered important was that by our own health department staff members. Practically everyone had been working in the program in some capacity. A carefully prepared questionnaire was given to each member of the staff, asking for replies and comments without any identification of the person furnishing the data. We felt that the staff was in a better position to evaluate the program from one angle at least because they could see changes that had taken place among the people whom they visited in the field.

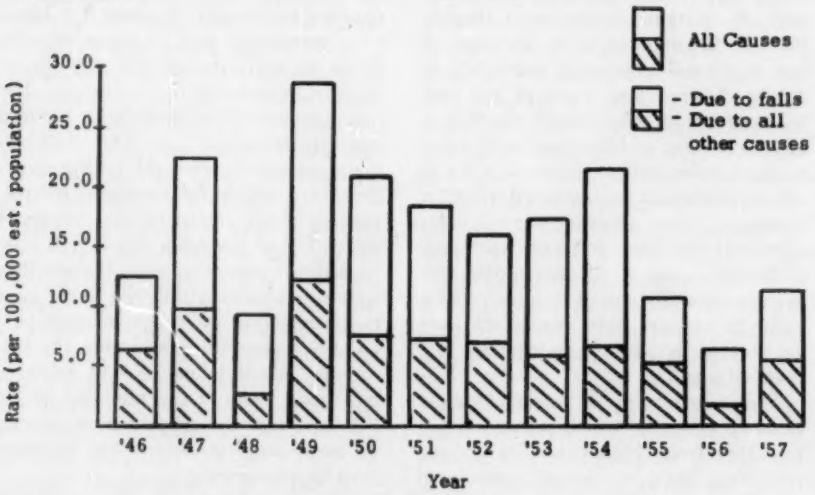
Another evaluation of the program was a review of newspaper coverage and of the kinds of coverage received by the program. Editorials, news articles, pictures, and many other contributions which had a widespread influence in the community indicated the genuine interest of the press in this subject. In the course of the program a series of leaflets were developed showing the necessary safety precautions for specific periods of infancy and childhood. Things that needed to be done in the interest of safety during the helpless age (one to three months), the age of awakening (four to six months), the curious age (seven to twelve months), the adventurous age (one to two years), the independent age (two to three years), and the experimental age (three to five years). Requests for permission to reprint this series of leaflets have come to our department from all over the United States and we estimate that between one and a half and two million of each of these leaflets have now been printed. They are being used largely by pediatricians, general practitioners,

and others in their offices. We use them in our child health conferences and in home visits. A large county medical society and one of the largest state health departments have within the last month requested permission to print these leaflets. Insurance companies have printed and distributed them. Pediatric societies have used them. We feel that this is a fair indication of the effectiveness of the program in the preparation of materials which may have far-reaching effects throughout our country.

Another outcome of the home safety project was the establishment of a much more adequate housing program within our city. We have the confidence and cooperation of the Apartment House Owners' Association and other organized rental groups, whereas previously the health department was looked upon as only a law enforcement agency. The personnel director's organization which is composed of representatives from many large companies became actively interested in home accident prevention in order to keep men on the job, and our working relationships with them were greatly improved. Interested PTAs, clubs, and many other organizations are difficult to evaluate in terms of figures or dollars and cents. Because of these improved working relationships and the realization by many people that the health department had a real contribution to make to our economy, it is the opinion of unbiased observers that the health department has grown in stature and respect in the community because of the valuable program which was developed. We were all working together against a common enemy, namely, accidents. Nothing pulls people closer together than common goals and objectives. The health department is not an ogre wielding a big club but a co-partner in an effort to provide a healthier, happier, safer citizenry of San Jose.

To anyone in the statistical field this description may appear to be a very

Figure 1—Fatal Home Accident Rate, by All Causes and by Falls, by Year—San Jose, 1946-1957



(Source: San Jose City Health Department, Mortality Records, September 15, 1958.)

Table 3—Fatal Home Accidents, by Type, by Year—San Jose, 1946-1957

Type of Accident	Year												Total
	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	
Falls	5	11	6	15	13	11	9	12	16	6	6	8	118
Asphyxiation	1	2	0	5	2	2	3	2	1	1	0	2	21
Burns	1	2	1	2	1	2	2	2	2	0	1	1	17
Poisoning	2	2	0	3	1	0	0	1	2	4	1	1	17
Drowning	0	0	0	0	3	0	0	1	1	1	0	1	7
Firearms	1	1	0	0	0	2	0	0	1	0	0	2	7
Other	0	1	1	1	0	1	2	0	0	0	0	0	6
Total	10	19	8	26	20	18	16	18	23	12	8	15	193

(Source: San Jose City Health Department, Mortality Records, September 15, 1958.)

fuzzy kind of evaluation, but these are real values which I would not trade for volumes of statistics, accurate as I might hope they would be and as costly as they might have been to secure.

At the present time we are engaged in another home accident project to determine a method by which we can pin point the individuals or families having the greatest number of home accidents. (This project is supported by a grant from the National Institutes of Health, PHS.) Approximately 90 per cent of our accidental poisoning morbidity is among children four years of age and younger. It is our hypothesis that a greater number of home accidents occur in the families with children of this age where poisoning has occurred than in a control group. In order to study comparatively the home accident experience of families, one of whose children has been accidentally poisoned, we selected a group at random from among all families in San Jose with a child under five years of age.

The selection of a random sample in our community, which population has increased from 10 per cent to 15 per cent each year for several years, was difficult. In order to allow for the factor of population change, the sample was selected in yearly stages, beginning with a fresh subsample each year. The random sample of a few years ago is no longer a random sample, consequently we are using subsamples for control, an interesting technic which our researcher and others developed.

This project presents an entirely different means of attempting to evaluate a relatively small group in a rapidly expanding community. Newness to a house or a community may be a predisposing factor to accidents so that this factor must be included in the evaluation. The measurement of the recall factor has also been an interesting one. Out of 27 patients who were brought to the emergency aid station for treatment for poisoning, in two instances, the parents of the child had forgotten that it had been treated for poisoning even though they were interviewed within two weeks after the event occurred and were prompted by direct questions concerning the poisoning. There is no way of knowing how many cases of this kind are missed but there must be a fairly large number of home accidents which are forgotten even in interviewing.

Four years from now when our project

is completed I hope we shall have better information as to evaluation technics which utilize a carefully controlled experiment. If a random sample is selected, we do not believe that the number of patients to be interviewed need be extremely large in order to have accurate results. As our experience grows within the next few years, we will be able to determine whether additional cases are necessary in order to evaluate the results of home accident prevention.

As public health administrators we wish to know why we want to evaluate our activities in the prevention of accidental injuries in the home. One, we want to find out if the procedures which we are using are of value to the community in lessening accidental injuries and deaths. This answer may be arrived at by an opinion poll as we did in the five-year study, or it may be determined by statistical procedures if these can be accurately collected

Two, our next reason for wanting to evaluate home accident procedures is to convince appropriating bodies that money is needed for the extension or development of these programs. I do not believe that most appropriating bodies are as easily convinced by statistics as they may be by the testimony of taxpaying groups who are benefiting by this service. Taxpayers' organizations may want sound statistics, but they also want the health department to show that home accidents are being prevented by what they do.

Third, evaluation is needed to convince staff members that the project which is undertaken is a worth-while, necessary activity which the staff can accomplish, given some inservice training and experience. I believe that the staff member's own introspective evaluation of what has been accomplished and what their co-workers have done, as well as discussion among themselves as to the value of the program, will largely convince them of the worthwhileness or of the uselessness of what they are doing. The interest of the health officer and other leaders in the home accident prevention program is also going to make a great deal of difference to the staff worker. Home accident prevention has lots of appeal because of its emotional content as well as the fact that it involves personal health, but the staff must have the tools, knowledge and training before we can expect them to carry out successfully a home accident program and therefore evaluate it as a worth-while activity.

Fourth, what does the press and the community at large think of your program to prevent home accidents? What does the medical profession think of your program? Have you stimulated the teachers in the public schools to better teach and dramatize the subject of home accident prevention? When physicians call the health department and ask for more of those developmental series leaflets for distribution to their patients; when teachers call the health department and ask for the home safety packets; when public health and school nurses are asked to participate and assist the teacher in planning home safety programs at school; when PTAs ask for speakers and programs on home safety—these are the things which tell you that your program is a good one, and which will also tell appropriating bodies that it is worth supporting. Can we measure the value of a home safety program? Perhaps not in cold figures, but we can certainly evaluate it in terms of human needs.

Health departments realize that many other agencies in the community are working in the field of safety. In fact a health department's part in the total result may be small. Evaluation which is measured by deaths or accidental injuries may show the results of the total activity in the community rather than that of the health department. In a complex social situation, it is impossible

to measure the effort of any single organization.

Evaluation and goals to be achieved are necessary in establishing any program, certainly a new one such as accidental injury prevention. The kind of evaluation to be used depends on one's objectives. Striving for a type of evaluation which cannot reasonably be attained may deter you from starting a safety program. One can be realistic and use a type of evaluation which is within one's ability to achieve results. The lives which we save are more important than the means by which we demonstrate how many we have saved.

Dr. Bissell is health officer and Mr. McInnes is a health educator, City of San Jose, Calif.

This paper was presented before a Joint Session of the Engineering and Sanitation, Food and Nutrition, Health Officers, and Public Health Education Sections of the American Public Health Association at the Eighty-Sixth Annual Meeting in St. Louis, Mo., October 29, 1958.

Fight for Sight Fellowships

The National Council to Combat Blindness, Inc., announces an increase in the stipend allowance for its Fight for Sight research fellowships. Formerly from $2,400 to $5,000 per year, the newly established range is from $3,600 to $7,500. The maximum allowance for student fellowship stipends, also increased, is now $300 per month. Student fellowships are awarded for a two or three month period. The council's Fight for Sight grants-in-aid and full-time research fellowships are generally awarded for a period of one year and may be renewed with the approval of the National Council to Combat Blindness' Scientific Advisory Committee. Total awards in 1959 amounted to $160,000.

January 1, 1960, has been designated as the closing date for receipt of applications for the 1960-1961 group of awards from applicants not requesting renewal support. Applicants (other than those filing for student fellowships) who wish to apply for continuation support are requested to file no later than March 15. Forms from the Secretary, National Council to Combat Blindness, Inc., 41 West 57th Street, New York 19, N. Y.

A further contribution to the problems touched on in the preceding article is this report from a large city—Philadelphia.

ACCIDENT PREVENTION IN A LARGE URBAN COMMUNITY

Emil A. Tiboni, M.P.H., F.A.P.H.A.

OUR PHILOSOPHY of accident prevention in Philadelphia involves the control of many specific types of accidental injuries rather than the discovery of an all-encompassing formula for prevention. In order to place ourselves in a position to conduct specific control measures, we have embarked on an orderly but limited series of studies. These studies have been designed to lead us from an overview of the general problem to a rather intimate knowledge of the circumstances of occurrence and methods of prevention of very specific injuries.

The first of these studies was a sample survey of all types of accidental injuries. Our interest is not limited to injuries which occur in the home. This survey was designed to provide rates of various types of injuries in each of two health districts with sharply contrasting socioeconomic and educational levels in the population. In addition, it included detailed reports of injuries which occurred in the home.

We have almost completed the field work of this survey and are now planning to move on to our next fact-finding step by seeking the cooperation of several large hospitals in reporting all accidental injuries seen by their staffs. Analysis of these reports should permit us to select various types and locations of injury-producing accidents for epidemiological follow-up. With the data obtained, we expect to be able to pinpoint the causes or circumstances of the accident with sufficient accuracy to permit the application of meaningful control measures. The recording and analysis of these reports is to be carried out in cooperation with the State Health Department which will be cooperating similarly with other communities. We expect to exchange experiences with these communities as our respective studies progress.

Some preventive work has also been started, primarily in our poison control program which is an integral part of our total accident prevention program. A feature of this program is a service which provides 24-hour emergency information. This service, which is rendered through our medical examiner's office, seeks to minimize the consequences of an accident which has already occurred. Perhaps this effort to minimize the harmful results of an accident could be expanded in principle to other types of accidents by the wider teaching of first aid. We have done nothing in this regard but I think that such efforts are a legitimate part of an accident prevention program.

Other aspects of the poison control program include voluntary reporting and provision of clinical data by hospitals and physicians, epidemiological follow-up of all reported cases by public health nurses, and public and professional education. The data received from epidemiological follow-up are currently being analyzed to provide guidance in the development of specific preventive efforts.

This aspect of the poison control program is an example of the practice cited earlier of trying to prevent specific types or kinds of accidental injuries.

Promotional and educational efforts in poison control have also been undertaken through the various commonly used media. The emergency number of the Poison Information Center is listed with Police and Fire under the emergency numbers of the Philadelphia telephone directory and the various metropolitan area suburban directories.

We think that our leaflet on accidental poisoning prepared through the cooperation of our Office of Health Education is very good, if you will pardon a seeming lack of modesty. There is a large and enthusiastic demand for it. Distribution of this leaflet to all public and parochial school teachers of the city is expected to be completed this fall. This leaflet is to be used by them along with other materials as source material for class instruction in the subject.

In addition to public education, professional education is being considered for those involved in the production and handling of potentially toxic substances. Naturally, whatever knowledge we have is already being shared with those responsible for the treatment of cases of accidental poisoning to the extent that our facilities and resources permit.

Special attention is being given to lead poisoning, although here I think that we are still behind such programs as those in Baltimore and St. Louis. Epidemiological follow-up of each reported case is conducted by the epidemiologist of the Division of Environmental Health. A form, specifically designed, is used to promote uniform recording of findings and to facilitate later analysis. Copies of the findings are sent to reporting physicians or hospitals for their records. The investigation includes laboratory analysis of paint or other samples suspected as sources of lead.

Public health nurses also follow up every case of lead poisoning. Their function, however, is to provide counseling with regard to prevention or management of the disease, rather than to gather data.

There has been reasonably good cooperation from the mass media in carrying stories on lead poisoning. Exhibits have been used to good advantage. A leaflet on the subject has been very well received, and in at least two cases symptoms were recognized and treatment requested as a result of reading the leaflet. Excellent cooperation has been received from the paint industry, including mention of our leaflet in several national trade journals.

There are many additional facets which this program needs. We are currently planning special studies, additional services, expanded education, and the development of legal control standards.

Our efforts in general education for accident prevention have been deliberately limited. Any efforts in or near the areas included in our sample survey have been avoided because we feared a possible temporary change in habits or reporting as a result of increased awareness. Since we felt that we would wish to concentrate our efforts in the areas which we were studying, rather than to work in areas where the results could not be evaluated, this meant a postponement of our educational efforts. The mass media have been used for only the most general informational or promotional purposes. As soon as the field work in the survey has been completed, organized community attention to accident prevention will be developed through systematic educational efforts.

At this point I wish to express my personal reservations regarding the value of so-called "safety education" as generally practiced. I think that most of it is bouncing off, either because of simple lack of penetration or because of outright rejection. Because of this concern, we

are planning to study, at least informally, the basic elements of emotion and motivation which go into the formation of attitudes toward prevention of various types of accidental injuries. A study group representing a broad combination of disciplines is being set up to examine this provocative subject.

As we prepare to move into a community-wide education and action program to deal with accidents of all types, we are in a favorable position as a result of past and current close working relationships with other agencies in the community. The chief of this section is chairman of the Home Safety Committee of the Greater Philadelphia Safety Council and is consequently centrally involved in council activities and decisions. Concrete major cooperation has also been exchanged with the Board of Education, the Health and Welfare Council, the American Society of Safety Engineers, the Boy Scouts, and various city departments and voluntary organizations.

In the remainder of this presentation, I shall review very briefly the sample survey of accidental injuries memtioned earlier, including some appraisal of its limitations. The survey was begun in the fall of 1956 and was planned to continue two years, one year in each of two health districts. One of the districts, District 1, has a population of about 130,000 persons, and covers an area in the center of the city which contains mostly row house construction of poor quality with considerable intermixture of nonresidential uses. The population is predominantly on a low socioeconomic and educational level, with some marked exceptions. The other district, District 10, has a population of over 150,000 persons and is located in the extreme northeastern end of the city about 15 to 17 miles from the center. It is largely suburban to rural in character with a generally middle class population. Housing is largely single detached or twin type construction in good condition with reasonably large yards. These districts do not represent the city as a whole. They represent rather approximate extremes in environmental and population characteristics.

The primary purpose was to establish rates of accidental injuries in these districts in order to measure the size of the problem and to establish a base line for later evaluation of program results. We were also interested in detailed information regarding the nature and circumstances of injuries which occurred in the home as a basis for the development of preventive programs.

The sample was drawn at random and used the census block as the unit of selection. The household of every dwelling unit within the selected blocks was interviewed. Blocks were used as sample units because we had no complete listing of dwelling units in the districts and any effective method of securing such a list would have been prohibitively expensive. Two sanitarians with college degrees and appreciable field experience functioned as interviewers. No publicity or educational campaigns were conducted in order, as mentioned earlier, to avoid any temporary effect on incidence and reporting.

Two field schedules* were used to record interview data. The first of these was the Household Schedule on which household composition and related descriptive data were recorded. On this schedule were also recorded the number of injuries of various types which occurred during designated periods. Another portion of this schedule was concerned with a subjective evaluation of the dwelling and premises. The second schedule was the Individual Home Injury Schedule. This was used to record detailed data regarding each home injury, both minor and major. Items in

* Copies of these schedules may be obtained by writing to Community Hygiene Section, Department of Public Health, 632 City Hall Annex, Philadelphia 7, Pa.

this schedule were designed to record the nature and circumstances of the injury.

Uniformity of questioning and approach was assured by the use of standard questions in the forms and by a detailed manual of procedures carried by each interviewer. Interviewers were under direct supervision of a district supervisor as well as the staff of the Accident Prevention Unit.

Data collected in the survey of this district have been transferred to IBM cards and a number of tables have been prepared and analyzed. The findings are, however, less interesting for the data they produce than they are for the lessons we think that we have learned in regard to surveying this type of population.

The findings must remain limited and in many cases, tentative, since we are deliberately withholding our conclusions until the analysis of data from Health District 10. A comparison of the major injuries reported with the findings of the National Health Survey appears to indicate under-reporting by respondents in the survey. A possible reason was a suspected lack of rapport between the interviewer and the respondent in many cases. This appears to have been associated with the relatively low socioeconomic and educational level of the population surveyed and loose family ties of this group. Since we also determined an excess of injuries for both Negro and white females over males, we believe the possible under-reporting to have been largely related to injuries of the males.

There was also a relatively high frequency of accidents in the home as compared with other classes. This fact and the apparent under-reporting of males are presumably related to interview bias. Possible evidence of such bias is also found in the fact that respondents, who were most frequently females, accounted for more than half of the injuries although they comprised only one-third of the persons included in the survey.

Evaluation of Methods and Procedures

We are not sure that the survey measured the true incidence of accidental injuries in this district. In addition to the suspected under-reporting, it cannot be established with certainty that the sample is representative of the population. This relates to our use of city blocks as sampling units and the further inclusion of nonresidential blocks in the sample. Since the most recent population data have been obtained from the 1950 census, and since it is known that substantial population changes have occurred in the interim, we are left with a practically unanswerable question until the next census at least.

Determination of the usefulness of the data in achieving the original objectives must await analysis of our work in District 10. Analysis of all data should be completed within the next few months. If under-reporting in this district has been as serious as suspected, there would be grave doubts regarding the usefulness of the data in establishing a base line for evaluation of future program efforts. We do not, however, see any other way within our resources by which such a base line could be established, but still feel that it is important to have one. We are hopeful that it will be possible to obtain such data in an area such as Health District 10 even if our suspicions of the data in District 1 are confirmed. (This hope has been dimmed further by Dr. Bissell's statements reporting their problems in gathering morbidity data on injuries.*) Although it is too early to say with certainty, it appears that this approach to the collection of data on accidental injuries is one which should

* The paper by Dr. Dwight M. Bissell, "The Development of a Local Accident Control Program," appears on page 1646 of this issue.

be used primarily, if not exclusively, by organizations capable of supporting highly specialized staffs.

Where do these various efforts leave us? We and many others in the country have advanced materially in our thinking on accident prevention in the past few years. It may be relatively unimportant whether an individual survey has or has not produced useful data or that a given effort has or has not reduced injuries. It is definitely desirable, however, that each of us try different approaches. In the process, we will have some successes as well as some failures. At this stage of development it is as important to know what will not work as to know what will work.

Some will scoff at this notion, but it represents an essential element in the development of maturity. The development of maturity is something which the accident prevention movement has needed badly but I think that we are beginning to achieve it. Soon we should not only reach the point where we can feel that we are functioning effectively but should be able to document some results in terms of a reduction of injuries and deaths. Let us speed the day by the effective exchange of our experience and our ideas.

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This paper was presented before a Joint Session of the Engineering and Sanitation, Food and Nutrition, Health Officers, and Public Health Education Sections of the American Public Health Association at the Eighty-Sixth Annual Meeting in St. Louis, Mo., October 29, 1958.

Seminar on Administration

The University of Minnesota School of Public Health and the Association of Business Management in Public Health will hold their joint sixth annual seminar on business management January 17-22.

Subjects: increasing administrative skills through inservice training; power structure in organizational systems; problems in public administration; health implications of current social and economic developments; problems in administering a combined nursing service; building better staff relations; making small groups effective; improving public relations; and applications of brain storming. There will be 12 hours for group study and six hours for general discussion.

Seminar faculty will include professors from the university's public health and journalism schools, representatives of the Association of Business Management in Public Health, and of local, state, and federal health agencies. Registration information from the Center for Continuation Study, University of Minnesota, Minneapolis 14, Minn.

State health departments cannot afford to overlook occupational health and its problems. This theme is illustrated and discussed best in terms of the experience of the State of Georgia.

TO EACH HIS OWN

A STATE OCCUPATIONAL HEALTH PROGRAM

Lester M. Petrie, M.D., M.P.H., F.A.P.H.A.

THE TITLE of this paper, "To Each His Own," is a concise statement of our belief that each individual has his own responsibilities and his own rewards. This applies to each employer, to each employee, and to each profession. It also applies to each organization, whether governmental or private enterprise. To each his own responsibilities and to each his own rewards.

The Industrial Hygiene Program of Georgia was officially initiated in 1941. At that time, we conceived our job to be twofold:

1. To teach industry its job in health protection.
2. To make the resources of the health department available to help get the job done.

We developed persuasive arguments as to the rewards. We attempted to convince industrial management that it could not afford to be without its own program. Our arguments "backfired" when alert management asked "If an employer cannot afford to be without an employee health service, why do you—the State Government—not provide this service for your own employees?" That was a good question. It convinced us that we in government should set a right example and provide for our own and then we could see more clearly the way to help others provide for their own. Hence, the title of this paper, "To Each His Own."

Occupational health is the health of employed people as it relates to their work and their working environment. Industrial hygiene is the study and control of the work and the working environment as it relates to the health of the employed people.

The estimated population of Georgia is 3.86 million. These Georgians live in about 1.1 million households. With the exception of some farms, most of the households are supported in whole or in part by the salaries and wages of our labor force of 1.35 million. The household heads are mostly the same people as the workers. We maintain that their health relates not only to their occupation but also to their home environment, and hence is of interest to the public health department.

In Georgia, private enterprise employs 813,000; nonmilitary government (federal, state and local) employs 170,000; 57,000 of these are in the federal government; 24,000, including some 7,000 in the University System, are employed by state government; and 88,000, including some 47,000 public school employees, are employed by local governments.

On the principle of "To Each His Own," we believe that the federal government as an employer has a responsibility for its own; that the state government has responsibility for its own; that our local governments have responsibilities for their own; and that private enterprises as employers have responsibilities for health programs for their own. Unfortunately, the present health practices of most of these employers leave something to be desired.

What is the sickness and injury experience of our workers? What is their health experience? Let us first discuss sickness and injury. It is estimated that 2½ per cent of our population are under professional care in any average day. This leaves 97½ per cent who are not. However, 60 per cent may visit a physician for sickness or injury at one time or another during an average year, but at any one time 75 per cent of our adults cannot name their own personal physician of choice. Twenty-five per cent of our population age 65 and over have never in their lives had a physical examination.[1]

Our belief that at any one time, 75 per cent of our adults cannot name their own personal physician of choice, is based on our pioneering Georgia experience in voluntary multiple test health screening of about 1.5 million people, a substantial sample of our total population.[2-5] It appears that about 75 per cent of the people who consulted a physician because of failure to pass a test did not visit the one whose name they gave at the time the test was performed. We maintain that their personal physician of choice is the one they consulted, rather than the one they named but did not visit. Another way of looking at this would be to say that "The choice of personal physician changes rather rapidly from time to time and, in fact, varies with the nature of the illness. The patient may go to one physician for a sore throat, and quite a different physician for a backache."[6] Another factor is that many people today are on the move—there is a high rate of migration. Fixed relationships between individuals and the providers of services (including physicians' services) are likely to be ephemeral.[7]

With regard to the 60 per cent who do visit a physician for sickness or injury during an average year, these employees often have limitation of physical ability after injury or illness, no matter whether the latter are or are not connected with the work. Injuries such as amputation of a limb in an auto accident or disease such as a heart attack are examples. It is a legitimate purpose of an occupational health program to keep such individuals gainfully employed by helping the individual find a job he can perform. This may entail referral to a rehabilitation center for specialized training before he returns to work.[8]

The above concerns sickness and injury experience. Let us return to the question now—What is the experience of these people in health? We estimate that not over 10 per cent of our people are under regular professional health supervision. This leaves over 90 per cent of our people who never seek medical health supervision, but visit a physician professionally only for sickness or injury.

What is the answer for the 90 per cent? The best answer is health education which teaches three things:

1. Inescapable responsibility of each individual for his own health;
2. Limitations of his own resources;
3. Community resources available to help him.

To help us teach these three things we have built an exhibit called the "sickness-health spectrum and the treadmill of life." Each living human being finds himself on the treadmill. The spectrum has death as its limit at the lower end. It approaches complete physical, mental,

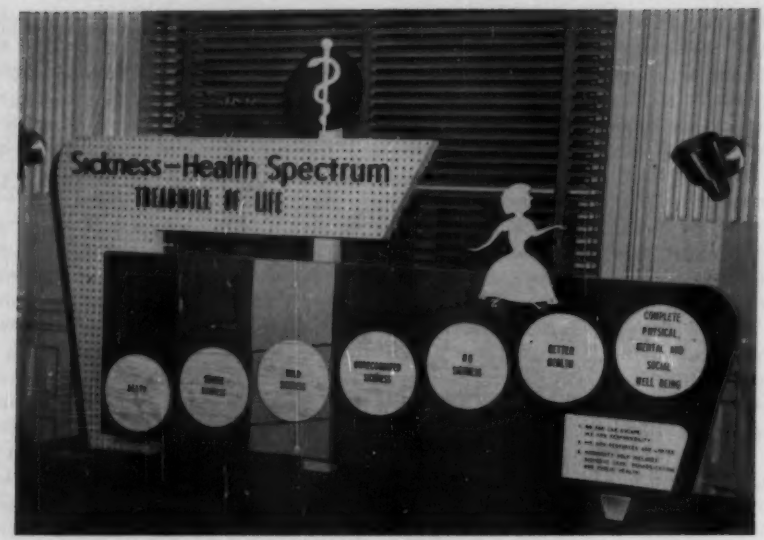

Figure 1—The Sickness-Health Spectrum

and social well-being as its upper limit. Between these two extremes are the zones of severe sickness, mild sickness, inapparent sickness, no sickness, and better health. No individual as he labors on the treadmill can escape his own responsibility for his own position on the spectrum. Second, no individual has within himself all the resources he needs. Third, there are outside resources available to him, to help him maintain or improve his position. Specialists in sickness care are available regardless of whether his sickness is severe, mild, or inapparent. Many health protections surround him, some even without his own knowledge, others readily available for the asking, others more difficult to obtain. In part of the spectrum where sickness care and health protection overlap, there is still another service—rehabilitation.

Similar basic lessons of health education apply to organizations:

1. Inescapable responsibility of each organization for the organization's health;
2. Limitations of the organization's resources;
3. Community resources available to help.

We know of no better answer than health education as defined and illustrated above for the 90 per cent of our people who otherwise never seek health supervision. The problem is to motivate them to be educated. Because of the human instinct for survival, the health tests are an attractive "bait," provided each individual is assured that the findings will be confidential. We have demonstrated in Georgia that voluntary health tests will motivate 80 per cent to 99 per cent of them to individual action for their own health's sake.

Multiple test health screening is approved only if it is correctly understood and only if it is performed in a professionally ethical manner under medical supervision, and only in those geographi-

cal areas where the procedure has the understanding and endorsement of the local health department and the local medical society. These and other cardinal principles have been unanimously approved by the Georgia Association of Local Public Health Physicians. A battery of health tests recommended by the Medical Association of Georgia for all adults in our school system has been published and is our guide.[9]

A State Occupational Health Program

A State Occupational Health Program such as we advocate can be described as operating from three bases. On the first base, we will find private enterprise; on the second base, government; on the third base, our schools. When all our players work together in teamwork throughout the state, we will not only have a smoothly operating statewide occupational health program but also more adequate public health. The custodian of any base will find an employee health service as useful to him as a glove is to a baseball player.

We believe that the Occupational Health Service developed by Dr. Logan T. Robertson of Asheville, N. C., is an outstanding example of private enterprise. The Georgia State Employees' Health Service, which we are about to describe, is an example of our efforts on second base. We consider the work of our State Industrial Hygiene Division equally important, but time does not permit us to describe it in this paper. The schools on third base should perform a double function:

1. Health Service for their own employees, the same as that provided by any other employer;

2. Use this service as a teaching demonstration. Demonstration is one of the best methods of learning on the part of both the teacher and the student. The principles outlined in this paper are being developed for teaching at Emory University Medical School.

The Georgia State Employees' Health Service is in its third year of operation. Its program appears to be entirely consistent with the resolution adopted by the American Public Health Association in 1957, "That the APHA recommend the early establishment and maintenance of occupational health programs by all governmental agencies for their employees."

The purpose of the Georgia State Employees' Health Service is primarily to teach our three basic principles of health education (individual responsibility, individual limitations and community resources) to all 24,000 employees of the state government. This is mass education. It reaches all individuals we employ—one after another. Initially, we reached about 20 per day, 80 per week, over 3,000 the first year. The goal is to effectively reach every employee.

This educational program is accomplished through three media:

1. Multiphasic health screening tests;
2. Counseling in health problems;
3. First aid and emergency service.

The multiphasic health screening procedure consists of an approved battery of health tests offered to each employee on an annual basis; the tests are designed to aid him and his private physician in health evaluation. The Health Service offers no medical care other than first aid, but through the three phases of the program, health problems are uncovered and employees are motivated to seek further medical evaluation, and treatment if necessary, from their private physicians. The Health Service tries to teach each employee to visit his personal physician to whom the results of the tests are reported if desired. It is hoped that eventually all personal physicians will permanently record the test findings of all our employees who consult them.

We believe that our experience is a

little different from the usual. Many industrial medical departments render repeated services during any particular year to a small percentage, perhaps from 10 to 25 per cent of the total employee population. The remaining 75-90 per cent receive little, if any service. It appears that if treatment or medical care other than first aid is offered in a health center, sick call for the few (usually repeaters) crowds out health service for the many. We think it is necessary to reach the apparently apathetic 75-90 per cent with an educational program designed to keep them healthy. Our program recommends to each one of them a visit to his personal physician for physical examination and personal health supervision. About 50 per cent who fail to pass one or more tests are again specifically urged to visit their personal physician for diagnosis and prevention or treatment of disease or injury as indicated. It is estimated that 90 per cent of those referred would not have visited the private physician had it not been for the screening and health education message that goes with the tests. This assures excellent relations with the private profession.

A protocol for promotion of an occupational health program for local governmental employees was unanimously approved by the Georgia Association of Local Public Health Physicians on May 30, 1958. The protocol gives a formula for estimating the financial value of a reduction in sick leave experience. Applying this formula to the workers employed in local governments in Georgia, it was estimated that the health service would only have to reduce sick leave by 0.175 sick leave hours per 100 man hours worked to offset the cost of the service. "Whether reductions in sick leave absenteeisms of this magnitude can be expected in any particular working establishment as a result of health services alone is problematical."[10] No one questions that a properly conducted medical service should reduce illness absenteeism. "However, absenteeism is a complicated business and it is pretty difficult to ascribe reductions, if any, to any one particular factor. The benefits that accrue to management from a healthier working force are not only in terms of dollar savings but more important, are in terms of better production, better morale, longer working life, etc.—factors whose dollar value is difficult to measure."[10]

The better each player does his part at his own base the greater the community rewards which we can all expect to share. It is difficult, if not impossible, for a sick population to compete successfully with a healthy population in the production of wealth. For example, in Georgia, as recently as 1936, there were 606 reported deaths and over 120,000 estimated cases of malaria. In that same year, 1936, there were 195 reported deaths and 926 reported cases of typhoid fever. These are examples of the fact that a large proportion of the population of Georgia was sick. Sickness was one of the basic reasons that President Roosevelt categorized the South as "The economic problem number one" because it was the sick part of the nation. Without regard to whether disease was transmitted by an insect, a human carrier, or an occupation, disease was a major reason why industry in Georgia could not prosper in those days. By 1951 and since, there has been no transmission of malaria in our state. Typhoid is also among the human diseases which have been substantially controlled. As a result, industry is able to prosper. The healthier our people become the greater will be our prosperity.

This observation which we have made in Georgia holds true throughout the world. Two-thirds of the world's 2.7 billion people live in undeveloped countries where disease rates are high, life expectancy is low and production of wealth is insufficient to maintain an ac-

ceptable minimum standard of living. Name the countries which have controlled malaria, yellow fever, typhus, typhoid, cholera, smallpox, silicosis, lead poisoning, and you are naming the countries which enjoy the highest economic development. For example, the United States with 6 per cent of the world's population, uses 50 per cent of the world's minerals; uses 50 per cent of the world's oil; produces 40 per cent of the world's goods and services.

Which is cause and which is effect? Is our high industrial production a result of our health? Is our health the result of our production? The answer is that they are interdependent. It seems that we cannot have either health or wealth unless we have both. Production appears to be the only source of the wealth which is now being or can be invested in either public health or private medical care. On the other hand, public health and private medical care are essential to maintain the productive capacity of our labor forces. America's occupational health and production today are both relatively good. Our real problem is the vital necessity of action today to insure our strength tomorrow.

Health departments which so desperately need money if they are to successfully cope with the challenge of the future cannot afford to ignore the occupational health approach. It deals with those who produce the wealth which we need and who represent the population we serve.

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This paper was presented before a Joint Session of the Occupational Health and Health Officers Sections of the American Public Health Association at the Eighty-Sixth Annual Meeting in St. Louis, Mo., October 30, 1958.

Today we are aware of the serious potentialities of air pollution and a considerable amount of research is being devoted to it. Here are some indications as to the meaning of this research.

NEW UNDERSTANDINGS FROM CURRENT ATMOSPHERIC POLLUTION RESEARCH

Moyer D. Thomas, D.Sc.

THE DISASTROUS air pollution episodes at Donora in 1948 and London in 1952, following the Meuse Valley episode of 1930, served to establish the serious potentialities of air pollution in our society and to focus attention on situations which at worst were formerly considered to be no more than nuisances. Fortunately, lethal episodes are rare. Beside the three events mentioned and another in Mexico due to an industrial accident involving hydrogen sulfide, there have been none that received widespread recognition at the time they occurred. A close study of the air pollution history of London and other cities has disclosed a number of occasions when a few deaths were probably due directly to this cause and several occasions when a considerable number of deaths occurred. This could have happened in other places also but the fatalities were not currently recognized and no general apprehension was aroused by any such incidents.

Of great concern at this time is the question whether sublethal concentrations of any pollutant in prolonged exposures can cause chronic effects on health or bodily function. The problem is complicated by the fact that there may be additive or synergistic effects between two or more constituents of a mixture of pollutants. It is also complicated by cigarette smoking. (Radioactive pollution is not considered here.)

Chemical Nature of Pollutants

Probably one of the most important "understandings" stemming from recent research is the recognition of two fundamentally different types of urban air pollution typified by the London smog and the Los Angeles smog. The London type smog is primarily coal smoke containing appreciable amounts of sulfur dioxide usually associated with more or less dense fog—a true smog. Due to the presence of sulfur dioxide, this smog is a chemically reducing system. It also contains the spectrum of organic compounds resulting from the incomplete combustion of coal in addition to the ash. The iron vanadium and manganese compounds in the ash plus the fog catalyze the oxidation of a substantial part of the sulfur dioxide to a sulfuric acid aerosol, which probably adds significantly to the irritating and toxic properties of the mixture.

The London smog has been analyzed routinely, only for sulfur dioxide and dust. The highest values were recorded during the episode of December, 1952.

Average 48 hour concentrations of 1.34 ppm sulfur dioxide and 4 mg/m³ solids were found.[21] The smoke load has reached 8 mg/m³ for short periods.[20] Sulfuric acid aerosol, when determined in good weather, has always been low, but much higher concentrations have been found in dense foggy weather, e.g., 2.5 mg/m³ along with 0.53 ppm SO_2 in a sample in 1929.[6] It is estimated that the life of a sulfur dioxide molecule in London fog is about 4.5 hours.

By contrast, the Los Angeles type smog generally contains neither coal smoke, fog, nor significant amounts of sulfur dioxide. Moreover, the mixture has oxidizing rather than reducing properties. The term "smog" is therefore a misnomer for this system, which results from photochemical reactions between volatile organic compounds—especially olefinic hydrocarbons—and the oxides of nitrogen. Automobile exhaust gases are the principal source of this pollution. During exposure for about an hour—more or less—to sunlight, photochemical reactions involving free radicals occur which produce a mixture of highly reactive peroxy-compounds plus ozone. These have eye irritating and crop damaging properties and polymerize in time to aerosols that reduce visibility. This so-called smog is dependent on sunlight. The oxidants increase during the morning hours to a maximum at midday then decrease to zero during the later afternoon.

Eye irritating properties may not disappear until late in the evening. During the night, the oxidants are absent, though their precursors are generally present at high levels. This may be readily shown by irradiating the night air with ultraviolet light. Ozone and other oxidants are produced the same as in sunlight.

In other cities various intermediate oxidation or reduction levels may be found depending on the nature of the pollutants and the meteorology.

Sampling Programs

The primary task in dealing with air pollution is to recognize, qualitatively and quantitatively, the substances that comprise the pollution. This may be fairly simple in some cases such, for example, as an isolated base metal smelter emitting only sulfur dioxide or perhaps hydrogen fluoride and small amounts of certain heavy metals. Urban air pollution is much more complex, containing as it does a great number of compounds beside those commonly determined. The great sampling network program which Mr. Stern described* is supplying a wealth of detail regarding the composition of the aerosols in all parts of the country. A few cities have analyzed the air in still greater detail. For example, in Louisville, Ky.,[13] about 30 specific organic compounds and classes of compounds from the rubber industry were inventoried in the stacks and subsequently determined in the atmosphere. In New Orleans, the interesting identification of caffeine derived from coffee roasting has been made in "network" samples.[16] Though it is not known what, if any, physiological significance beyond odors may be attached to these compounds, a knowledge of their identity and amounts will permit an intelligent solution of any problems they present.

In Los Angeles, continuous monitoring of the atmosphere for gases—carbon monoxide, sulfur dioxide, nitric oxide, nitrogen dioxide, olefinic compounds, oxidants, ozone, and smog precursors—is done at several locations. Aerosols are also determined routinely by high volume filtration to collect weighable amounts of solids for analysis and by filtration through paper to give a series of spots that are related to the "dirtiness" or soiling power of the atmosphere.

* Stern, Arthur C. Present Status of Atmospheric Pollution in the United States. (To be published in a future issue of this Journal.)

The records obtained by these methods give a fairly complete picture of the pollution in various parts of the city.

Eye Irritants

Owing to the complexity of the mixture, exact identification of the eye irritating compounds in Los Angeles smog has not yet been accomplished. These are associated with aerosols because when the particulate matter is removed from the air, the eye irritating properties of the smog are greatly reduced though not entirely eliminated. Probably the active compound or compounds are gases adsorbed on the aerosols. They are considerably more stable than the oxidants. Whereas they appear to be fairly well correlated with the oxidant level between 8:30 a.m. and 4 p.m., they may persist until from 8 to 9 p.m. after the oxidants have disappeared. Compounds that are strongly suspected of being the principal irritants[8] include the mononitro olefines and possibly formic acid. Branched chain and internally double-bonded olefines yield the most irritating products; 2-nitro-2 butene causes eye irritation at 10 to 15 ppb.

Ozone and Plant Toxicants

The plant damaging substances that produce typical "smog" symptoms on plant leaves as distinct from ozone symptoms are probably included in the group of peroxidized organic compounds, though again exact identification has not been made. Such ozonides and preparations of compound X (acyl per oxynitrite) as have been investigated, do not appear to damage plants in realistic concentrations, due possibly to their instability and short life. The behavior of ozone is intriguing. When present alone, it causes characteristic upper surface flecking of the plant leaves at very low concentrations (0.1 to 0.2 ppm in one to four hours). If the other oxidants of smog are also present, even though ozone may be the major constituent of the oxidant mixture, the characteristic ozone markings are not produced. Rather the lower surface silvering or bronzing is observed along with the other typical "smog" damage. Typical ozone injury has seldom been reported in the Los Angeles area where "smog" is common. Recently, an ozone stipple on grapes and other plants, of widespread occurrence, has been recognized.

No definite effects of ozone or oxidants on human health have been observed in Los Angeles though concentrations above 0.5 ppm have been measured frequently. Mills[12] is responsible for the statement that there is an association of significant proportions between Los Angeles smog and rise in day-by-day respiratory and cardiac deaths in the exposed population. This conclusion requires much more study before it can be accepted.

Carcinogenic Compounds

Work on the organic fraction of the air pollutants is being prosecuted intensively in England and Europe[3,9] as well as in the United States[17] using new chromatographic methods to isolate the compounds and spectrophotometric methods for their identification. The aromatic polycyclic hydrocarbons are now well understood in relation to coal smoke and auto exhausts. With a few exceptions the same substances are found in these sources and in the atmosphere. A few appear in the atmosphere but not in these sources and vice versa, suggesting still other sources and also lability. The great carcinogenicity of 3-4 benzpyrene, 1-2, 5-6 dibenzanthracene, and 3-4, 8-9 dibenzpyrene is well established. The other polycyclic hydrocarbons are less carcinogenic in general.

Analysis of the atmosphere in British cities[10] shows concentrations of 3-4 benzpyrene up to 30 $\mu g/1{,}000 m^3$. Kotin found this concentration in Los Angeles

in 1952-1953. Danish[3] and Norwegian cities[4] had about half as much and the rural atmosphere in England about a tenth as much. Mortality of nonsmokers in the Liverpool, England, area due to lung cancer is nine times as great in the urban population as in the rural population, thus corresponding to the urban-rural ratio for 3-4 benzpyrene 9:1. The mortality ratio approaches unity for very heavy smokers. It is suggested by Stocks and Campbell[15] that about half the lung cancer deaths in Liverpool were due to cigarette smoking and three-eights to the urban air pollution factor.

Kotin[9,10] has sought other carcinogenic pollutants among the aliphatic compounds because Los Angeles smog is based primarily on the aliphatics. Air samples filtered to remove 3-4 benzpyrene and other aromatic polycyclic compounds were passed through Shephard traps. The collected material was moderately carcinogenic to C57 mice. Artificial smog or ozonized gasoline, free of aromatics, but at unrealistically high concentrations, produced about three times as many total pulmonary tumors and 31 times as many multiple tumors in Strain A mice in 40 weeks as were produced in a carbon filtered control atmosphere. This striking effect implicates the aliphatics, possibly the epoxides among other reactive types. After 52 weeks the ratios fell to double the total tumors and five times the multiple tumors.

Respiratory Irritants

An area of great importance that is yielding newer "understandings," concerns the role of aerosols in modifying the toxicity of gases. LaBell, Long and Christofano,[11] found that the relative rates of penetration into the lungs of gases and aerosols determine whether the toxicity of the gas will be increased or decreased by the aerosol: if the rate of penetration by the aerosol is greater than by the gas, the toxicity of the latter will be increased, presumably by having the gas absorbed in the particles and carried in greater quantity and/or depth into the lungs. The reverse is true if the penetration by the aerosol is less than by the gas.

Amdur[1] has developed technics for measuring rate and depth of respiration and also pulmonary resistance and relaxation to reveal bronchial restriction. The method employs a recording plethysmograph and an intrapleural manometer to follow the changes in pressure, tidal volume, and rate of air flow to and from the lungs. The effects of air pollutants can thus be seen immediately whether the concentrations are high or in a realistic range.

Irritant gases and aerosols have a strong tendency to increase resistance to respiration. Work with mixtures of sulfur dioxide and sulfuric acid aerosol has shown that resistance to breathing due to the mixture is considerably greater than the sum of the resistances due to the two substances when tested separately, provided the aerosol is not too large. Particles of 0.8 micron show this effect strongly, those of 7-8 microns, not at all. If the particle size is about 2.5 microns, this synergistic effect disappears and the mixture will give somewhat less than the sum of the effects of its components. The major bronchi are probably involved in this case.

Amdur has also found that a fine inert aerosol of sodium chloride (0.25 micron diameter) increases the effect of sulfur dioxide, but a coarse aerosol does not. For example, an elevated level of resistance due to sulfur dioxide may be established with a given concentration of the gas. The addition of fine sodium chloride aerosol increases this resistance to a still higher level. When treatment is stopped, the sulfur dioxide curve commences to go down at once, but there is no immediate lowering of resistance in the sulfur dioxide plus salt curve. Rather

the higher level may be maintained for about an hour before a gradual decrease commences.

The effect of the aerosol in increasing the resistance to respiration due to sulfur dioxide is relatively much greater at low than at high concentrations as follows:

SO_2 (plus NaCl) ppm	SO_2 Alone Giving Same Response ppm	Ratio
250	800	3.2
90	300	3.3
26	110	4.2
8	90	11.1
2	70	35.0

Whereas sulfur dioxide at 250 ppm with salt aerosol has the same power of restrictions as 800 ppm without salt aerosol, for a ratio of 1:3.2, at 2 ppm with aerosol the equivalent concentration without aerosol is 70 ppm for a ratio of 1:35. Evidently a low concentration of sulfur dioxide could represent a serious hazard in the presence of certain aerosols.

Epidemiology

The epidemiological approach[2,5,18] to chronic air pollution problems is difficult and early efforts based on diaries and personal interviews, though useful, left much to be desired. However, with experience and objective test methods for measuring respiration, augmented by laboratory studies, the work is really gathering momentum. Bronchitics, asthmatics, and cardiacs are most likely to show positive effects. As one reads the medical section of the Proceedings of the Air Pollution Research Planning Seminars held in December, 1956, and February, 1958,[18] one is struck with the large amount of competence that is being applied in this field. It would be premature to attempt a discussion at this time, but the prospects are bright for adequate "understandings" of this complex subject in the not too distant future.

On the other hand, discomfort, psychological reactions, and outright fear—even terror—are experienced by many people who are subjected to no more than average air pollution. These responses are none the less real even if adverse health effects are not demonstrable. D. H. Hutchison suggests that we need an entirely new set of standards which he would designate M.A.C.C.—Maximum Allowable Comfort Concentrations.

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Prophylactic Value of Human Contact

"Compared with the demands for admission made by single men and women and, to a larger extent, the widowed, the proportion of married men and women aged 65 years and over in all hospitals is relatively small. In fact, among the married the rise in the proportion of those hospitalized with advancing age is not very striking and does not reach high levels even after the age of 75. In England and Wales two-thirds of all general and mental hospital beds occupied by those over 65 years are taken up by the single, widowed and divorced. The single (i.e., never married) who constitute 12.6% of the population of 65 years and over, contribute 55.4% of admissions to mental hospitals. Providing more human contact for those without relatives or friends must therefore claim high priority in any prophylactic endeavour on behalf of the aged in the community."

(Report: Mental Health Problems of Aging and the Aged, World Health Organization Technical Report Series, 1959.)

This study was undertaken to establish an adequate vision screening program for elementary school children. Many different screening procedures were tried and compared. The results are discussed and recommendations are given for a satisfactory program.

DESIGN AND EVALUATION OF A VISION SCREENING PROGRAM FOR ELEMENTARY SCHOOL CHILDREN

Henrik L. Blum, M.D., M.P.H.; Henry B. Peters, O.D.; Jerome W. Bettman, M.D.; Victor Fellows, Jr., M.D.; and Frank Johnson, O.D.

WE ACCEPT that visual performance has, as a minimum, relationships to achievement, safety, and adjustment and that it will be particularly important for children in the elementary schools. The problem then is to identify those children who have problems of vision or some other ocular condition, so that they may be referred for professional evaluation and care which will restore their visual performance to an optimum level. Ideally, one might hope for a thorough professional eye examination for every child before entering school. Generally this is not feasible and vision screening must fill this need.

Each visual function is a continuous variable showing distributions of various types, but always continuous, and as a result children cannot be divided into "pass" or "fail" on a nonexistent bimodal distribution. It is easy to see why it has been difficult for qualified experts to agree on screening test cut-off points at which a child should be referred for a specialist's evaluation. In most prior studies the clinical standards were the expression, in clinical terms of the judgment of one or more optometrists or ophthalmologists. In some studies the basis for these standards is not given. In very few has there been any attempt to evaluate the standards and in fewer still has there been any attempt to bring the two interested eye professions together on the matter.[1-5]

Origin of the Orinda Study

A number of factors influenced the development of this study. Significant interest was generated when California law required each elementary school to provide "adequate" testing of each child's eyes. Widely accepted procedures and standards were needed which could be applied in an average community and school system so that "adequate" testing could be achieved in fact. The county superintendent of schools and various school district superintendents, faced with the problem of making necessary provisions, asked for recommendations from the County Health Department. The Health Department is vitally interested in community health and preventive practices for all segments of its 400,000 population. Although it has only very limited legal responsibilities (primarily communicable disease control and

environmental sanitation), it makes every effort to promote good health education and health practices and standards for the 100,000 students in 34 autonomous school districts. Even though all but the smaller schools provide their own nursing services, the department provides consultation to schools in all areas of health. This is done through an assistant health officer, dental consultants, health educators, nurses, and sanitarians in the areas of curriculum, school health practices, examinations, records, sanitary inspections, and so forth.

On reexamination of the problem of vision testing, the Health Department soon discovered the lack of satisfactory screening methods, the disagreements within and between the eye disciplines, and the impossibility of suggesting procedures that actually could be regarded as adequate. Since members of the Health Department are on the faculties of both the Stanford University Medical School and the University of California, the Department of Ophthalmology of the one, and College of Optometry of the other were approached on this problem. The Health Department was able to utilize its strategic position to bring all interested parties together, including parents, local educators, and local, as well as university-based, practitioners of both eye disciplines. The parents and officials of the Orinda School District were easily interested and performed an extensive supportive and participating role in a three-year research project offering prospects of long-range benefit to children.

Study Design

Screening was performed on each child enrolled in grades one through six in the Orinda School District in 1954. Each technic was administered in such a way, and by personnel so trained as to approximate a probable, usual administration of each method. Clinical examinations were made on children failing any one of the screening tests. They were also done on a control group of one-fifth of the children selected randomly by the school administration in each grade. The clinical examinations were done independently by an optometrist at the University of California School of Optometry and an opthalmologist at the Stanford University School of Medicine. Determination of the need for professional attention, regardless of therapy, was made jointly by the professional committee from the combined examination reports. The latter, in turn, served as a basis for determining specific clinical standards at the end of the first year. These standards were then adopted as the criteria for referral in the succeeding two years when the same pattern of rescreening and reexamination of all the children was repeated. The entire control group was given a repeat clinical examination in 1956.

Representative procedures were chosen and included: (1) Parent questionnaire or symptom inventory, modified in 1956. (2) Teacher observation, after a five-hour training course given by opthalmologists and optometrists. (3) Nurse observation. (4) California State Department of Education Suggested Procedures, with the teacher testing visual acuity with the Snellen illiterate E, with glasses if worn, and repeated through a +1.50 and a +2.00 lens. The cover test was abandoned after the first year. The nurse retested all failures before they were classified as referrals. Nurses did both the testing and retesting in 1956. (5) The Massachusetts Vision Kit (MVK) was administered by a trained nurse and in 1956 a second failure at the hands of a second trained nurse was required before a child was classified as needing referral. (6) Telebinocular (Teleb.) was administered as the MVK above, including all tests except 8, 9, 12,

Table 1—Clinical Criteria for Referral

	"Correct-Referral"
A. Visual acuity	20/40 or less, either eye
B. Refractive error	
1. Hyperopia	+1.50 D.S. or more
2. Myopia	−0.50 D.S. or more
3. Astigmatism	±1.00 D.C. or more
4. Anisometropia	±1.00 D. or more
C. Coordination problems	
1. At distance (20 feet)	
a. Tropia	Any tropia
b. Esophoria	5Δ or more
c. Exophoria	5Δ or more
d. Hyperphoria	2Δ or more
2. At near (16 inches)	
a. Tropia	Any tropia
b. Esophoria	6Δ or more
c. Exophoria	10Δ or more
d. Hyperphoria	2Δ or more
D. Organic problems	Any verified pathology or medical anomaly of eye and/or adnexa

13, and 14. (7) The Worth Four Dot Test was done only in 1955. (8) The Modified Clinical Technique (MCT), refined at the University of California School of Optometry, was administered in the school by an optometrist. It includes visual acuity, cover test, skiametry, and inspection for organic problems.

Results

Clinical Criteria—As a result of agreement on clinical findings that determined which children deserved referral for professional eye attention, clinical criteria were established for four variables that were shown to be relatively independent. All four of these criteria, visual acuity, refractive error, coordination and organic problems, but no more, were necessary to fail all children who needed professional eye attention. Table 1 shows the limits established in the four areas. Table 2 gives the relationships to a nation-wide interprofessional screening questionnaire with the first three quartiles of responses shown. The application of these four criteria and the relative size of the number that failed by each criteria for one year, 1954, is shown in Figure 1.

Effectiveness of Vision Screening Procedures—Figure 2 shows the relative merits of the different procedures used in 1956, the third year of testing. The most effective procedure, by a considerable margin, is the MCT. It employs a few tests that cover a wide range of problems and has flexibility so that standards may be varied or tests changed to satisfy any set of local and professional demands. The MVK makes relatively few overreferrals, but misses approximately half of those needing referrals. The Telebinocular also finds approximately half, but overrefers a great many. The procedure suggested by the State Department of Education misses approximately three-fourths of the correct referrals, but when the cover test is eliminated keeps the overreferral rate very low. The various forms of observation and questionnaires were of little value in our hands. Table 3 shows the statistical treatment of the data and the consistency of the findings for the three age groupings studied.

Costs of Screening—Currently paid hourly wages were utilized. Teachers and school nurses who are on a monthly salary were considered to have a cost factor equal to their hourly wage for the hours spent. Their overhead costs were ignored. Volunteers' time was significant, but was considered as cost free. Table 4 shows the breakdown, by test, for each of the three years. In 1956 costs were 37 cents per pupil for MVK, 42 cents

for the Telebinocular, 45 cents for the MCT. Even with no training time involved in 1956, carrying out the state suggested procedure was the most expensive at 53 cents per pupil.

Correct referrals must be regarded as a necessary community cost. However, overreferrals represent an unnecessary community cost. In Table 5 an estimate is made of what each screening procedure would cost the families in the community as a result of overreferrals. Failure to detect significant defects, the underreferrals, are also shown on this table. Since MCT found nearly all of the cases needing referral, or twice as many as the next best test, and made essentially no overreferrals, it was concluded that the MCT was much the least expensive to the community as well as being the most efficient test we used.

Vision Status and Previous Care—The proportion of children with vision problems increased approximately 1.6 per cent per year with age over the period of time studied. In the age grouping five, six, and seven approximately 18 per cent had problems by our criteria. This increased to 31 per cent of the children in the age grouping 13, 14, and 15. It was found that more than half of those who had received professional attention previously could still not meet the study standards at the time they were screened in school. However, the majority of such children could be brought to our standards with further care.

Changes with Time—A Longitudinal

Table 2—Clinical Criteria Compared to Interprofessional Screening Questionnaire

		"Correct-Referrals"		
		Questionnaire by Quartile		
	Clinical Criteria	Q 1	Q 2	Q 3
A. Visual acuity	20/40	20/30	20/30	20/40
B. Refractive error				
1. Hyperopia	+1.50	+1.00	+1.50	+2.00
2. Myopia	−0.50	−0.50	−0.50	−0.75
3. Astigmatism	±1.00	±0.50	±0.75	±1.00
4. Anisometropia	±1.00	±0.75	±1.00	±1.50
C. Coordination problems				
1. At distance				
a. Tropia	Any	Any	Any	Any
b. Esophoria	5Δ	3Δ	4Δ	6Δ
c. Exophoria	5Δ	3Δ	5Δ	8Δ
d. Hyperphoria	2Δ	1Δ	1Δ	2Δ
2. At near				
a. Tropia	Any	Any	Any	Any
b. Esophoria	6Δ	2Δ	4Δ	7Δ
c. Exophoria	10Δ	8Δ	10Δ	12Δ
d. Hyperphoria	2Δ	1Δ	1Δ	2Δ
D. Organic problems	Any	Any	Any	Any

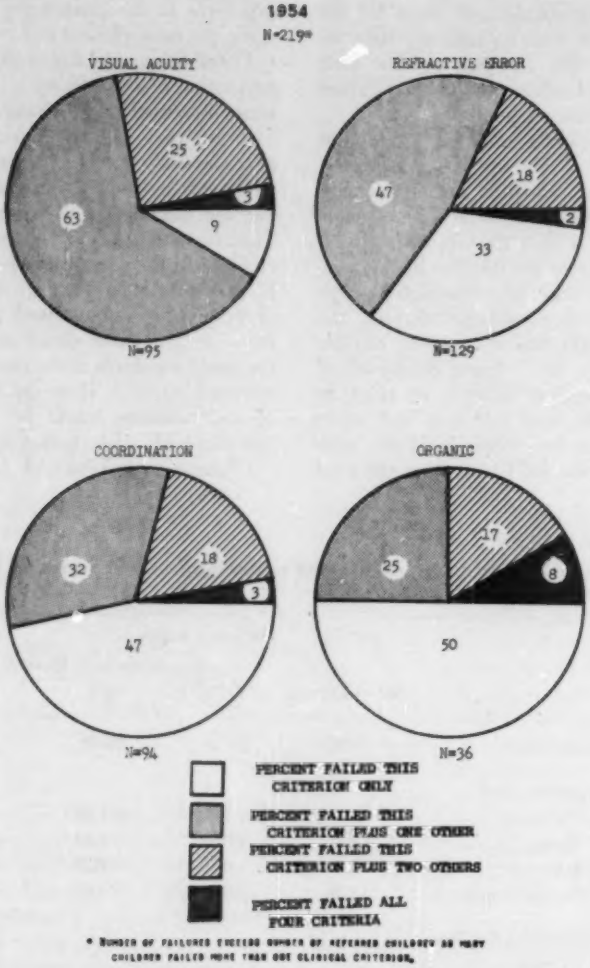

Figure 1—Clinical Criteria Failed, Correct Referrals, 1954

Study—Changes in the two-year interval, 1954-1956 (three years of testing) occurred more frequently among those with vision problems initially than among those who passed the tests. Large shifts toward more myopia, by those already myopic, and a shift of some normals to myopia were the major changes. This predominant shift was a major determinant in our recommendations for a choice of a screening device in the succeeding years of testing. Children with referable hyperopia tended to show slightly more hyperopia.

Recommendations

A successful vision screening program is greatly needed in elementary schools and can be set up in the following manner:

1. A steering committee with representatives from education, opthalmology, optometry, public health, and parent groups should develop the program. The committee, through its professional members, must obtain acceptance of the program and screening criteria by the professional persons in the community.

Figure 2—1956, Effectiveness of Screening

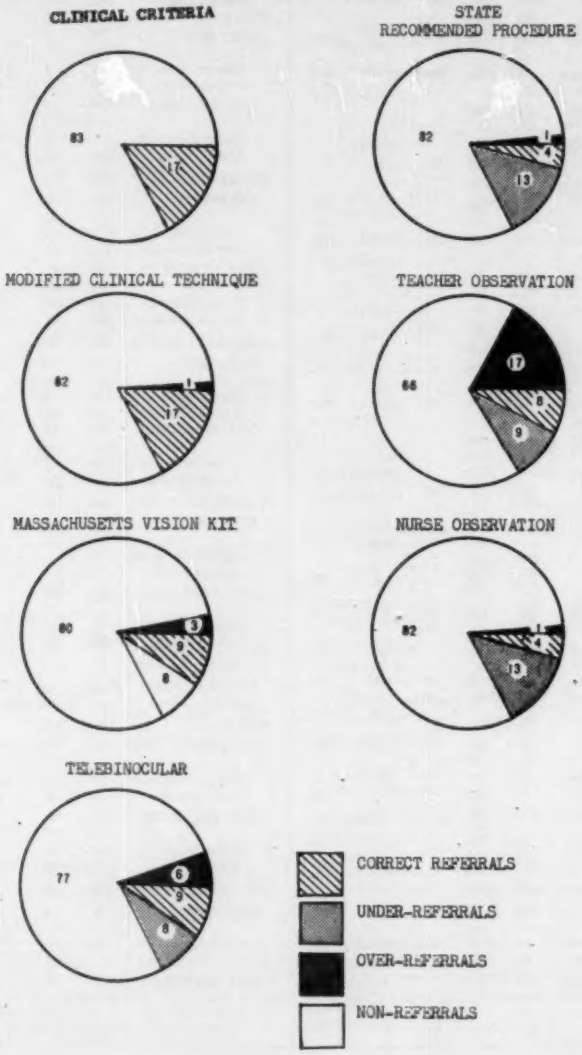

Table 3—1956 Effectiveness of Screening*

CLINICAL CRITERIA	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1274	100			
REFERRED	221	17		ϕ	/100
Correct-Referrals	221	17	100	(1.00)	100
Over-Referrals	–	–			–
NOT REFERRED	1053	83		rt	
Under-Referrals	–	–		(1.00)	–
Non-Referrals	1053	83	100		
AGE GROUP 7-8-9	393	100			
REFERRED	72	18		ϕ	/100
Correct-Referrals	72	18	100	(1.00)	100
Over-Referrals	–	–			–
NOT REFERRED	321	82		rt	
Under-Referrals	–	–		(1.00)	–
Non-Referrals	321	82	100		
AGE GROUP 10-11-12	533	100			
REFERRED	83	16		ϕ	/100
Correct-Referrals	83	16	100	(1.00)	100
Over-Referrals	–	–			–
NOT REFERRED	450	84		rt	
Under-Referrals	–	–		(1.00)	–
Non-Referrals	450	84	100		
AGE GROUP 13-14-15	348	100			
REFERRED	66	19		ϕ	/100
Correct-Referrals	66	19	100	(1.00)	100
Over-Referrals	–	–			–
NOT REFERRED	282	81		rt	
Under-Referrals	–	–		(1.00)	–
Non-Referrals	282	81	100		

TEACHER OBSERVATION	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1274	100			
REFERRED	324	25		ϕ	/100
Correct-Referrals	106	8	46	0.24	33
Over-Referrals	218	17	21		67
NOT REFERRED	950	75		rt	
Under-Referrals	115	9	52	0.41	35
Non-Referrals	835	66	79		
AGE GROUP 7-8-9	393	100			
REFERRED	117	30		ϕ	/100
Correct-Referrals	38	10	53	0.24	32
Over-Referrals	79	20	25		68
NOT REFERRED	276	70		rt	
Under-Referrals	34	9	47	0.32	29
Non-Referrals	242	61	75		
AGE GROUP 10-11-12	533	100			
REFERRED	138	25		ϕ	/100
Correct-Referrals	43	8	52	0.25	31
Over-Referrals	95	17	21		69
NOT REFERRED	395	75		rt	
Under-Referrals	40	8	48	0.42	29
Non-Referrals	355	67	79		
AGE GROUP 13-14-15	348	100			
REFERRED	69	19		ϕ	/100
Correct-Referrals	25	7	38	0.22	36
Over-Referrals	44	12	15		64
NOT REFERRED	279	81		rt	
Under-Referrals	41	12	62	0.40	59
Non-Referrals	238	69	85		

NURSE OBSERVATION	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1274	100			
REFERRED	51	5		ϕ	/100
Correct-Referrals	47	4	21	0.40	92
Over-Referrals	4	1	1		8
NOT REFERRED	1223	95		rt	
Under-Referrals	174	13	79	a	342
Non-Referrals	1049	82	99		
AGE GROUP 7-8-9	393	100			
REFERRED	11	3		ϕ	/100
Correct-Referrals	9	2	12	0.28	82
Over-Referrals	2	1	1		18
NOT REFERRED	382	97		rt	
Under-Referrals	63	16	88	a	572
Non-Referrals	319	81	99		
AGE GROUP 10-11-12	533	100			
REFERRED	25	5		ϕ	/100
Correct-Referrals	23	5	28	0.47	92
Over-Referrals	2	b	b		8
NOT REFERRED	508	95		rt	
Under-Referrals	60	11	72	a	240
Non-Referrals	448	84	100		
AGE GROUP 13-14-15	348	100			
REFERRED	15	4		ϕ	/100
Correct-Referrals	15	4	23	0.44	100
Over-Referrals	–	–	–		–
NOT REFERRED	333	96		rt	
Under-Referrals	51	15	77	a	340
Non-Referrals	282	81	100		

STATE RECOMMENDED PROCEDURES	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1269	100			
REFERRED	64	5		ϕ	/100
Correct-Referrals	54	4	25	0.41	84
Over-Referrals	10	1	1		16
NOT REFERRED	1205	95		rt	
Under-Referrals	166	13	75	a	259
Non-Referrals	1039	82	99		
AGE GROUP 7-8-9	388	100			
REFERRED	17	4		ϕ	/100
Correct-Referrals	14	3	19	0.35	82
Over-Referrals	3	1	1		18
NOT REFERRED	371	96		rt	
Under-Referrals	58	15	81	a	341
Non-Referrals	313	81	99		

Table 3—1956 Effectiveness of Screening* (continued)

AGE GROUP 10-11-12	533	100			
REFERRED	33	6		ϕ	/100
Correct-Referrals	26	5	32	0.45	79
Over-Referrals	7	1	2		21
NOT REFERRED	500	94		rt	
Under-Referrals	56	11	68	a	170
Non-Referrals	444	83	98		
AGE GROUP 13-14-15	348	100			
REFERRED	14	4		ϕ	/100
Correct-Referrals	14	4	21	0.42	/100
Over-Referrals	–	–	–		–
NOT REFERRED	334	96		rt	
Under-Referrals	52	15	89	a	372
Non-Referrals	282	81	100		

MASSACHUSETTS VISION KIT	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1178	100			
REFERRED	144	12		ϕ	/100
Correct-Referrals	111	9	55	0.59	77
Over-Referrals	33	3	3		23
NOT REFERRED	1034	88		rt	
Under-Referrals	91	8	45	0.83	63
Non-Referrals	943	80	97		
AGE GROUP 7-8-9	360	100			
REFERRED	47	13		ϕ	/100
Correct-Referrals	36	10	54	0.58	77
Over-Referrals	11	3	4		23
NOT REFERRED	313	87		rt	
Under-Referrals	30	8	46	0.85	64
Non-Referrals	283	79	96		
AGE GROUP 10-11-12	479	100			
REFERRED	53	11		ϕ	/100
Correct-Referrals	38	8	51	0.55	72
Over-Referrals	15	3	4		28
NOT REFERRED	426	89		rt	
Under-Referrals	36	8	49	0.81	68
Non-Referrals	390	81	96		
AGE GROUP 13-14-15	388	100			
REFERRED	44	13		ϕ	/100
Correct-Referrals	37	11	60	0.66	84
Over-Referrals	7	2	3		16
NOT REFERRED	294	87		rt	
Under-Referrals	25	8	40	0.90	56
Non-Referrals	269	79	97		

TELEBINOCULAR	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1274	100			
REFERRED	189	15		ϕ	/100
Correct-Referrals	113	9	56	0.51	63
Over-Referrals	67	6	7		37
NOT REFERRED	999	85		rt	
Under-Referrals	89	8	44	0.74	49
Non-Referrals	910	77	93		
AGE GROUP 7-8-9	361	100			
REFERRED	55	15		ϕ	/100
Correct-Referrals	33	9	50	0.46	60
Over-Referrals	22	6	7		40
NOT REFERRED	306	85		rt	
Under-Referrals	33	9	50	0.72	60
Non-Referrals	273	76	93		
AGE GROUP 10-11-12	480	100			
REFERRED	67	15		ϕ	/100
Correct-Referrals	44	10	59	0.56	66
Over-Referrals	23	5	6		34
NOT REFERRED	413	85		rt	
Under-Referrals	30	6	41	0.82	45
Non-Referrals	383	79	94		
AGE GROUP 13-14-15	338	100			
REFERRED	58	17		ϕ	/100
Correct-Referrals	36	11	58	0.51	62
Over-Referrals	22	6	8		38
NOT REFERRED	280	83		rt	
Under-Referrals	26	8	42	0.77	45
Non-Referrals	254	75	92		

MODIFIED CLINICAL TECHNIQUE	Number	% Total	% Criter.	Cor. Coef.	P
TOTAL	1251	100			
REFERRED	229	18		ϕ	/100
Correct-Referrals	215	17	98	0.93	94
Over-Referrals	14	1	1		6
NOT REFERRED	1022	82		rt	
Under-Referrals	4	b	2	1.00	2
Non-Referrals	1018	82	99		
AGE GROUP 7-8-9	386	100			
REFERRED	80	21		ϕ	/100
Correct-Referrals	71	18	99	0.92	89
Over-Referrals	9	3	3		11
NOT REFERRED	306	79		rt	
Under-Referrals	1	b	1	1.00	1
Non-Referrals	385	79	97		
AGE GROUP 10-11-12	525	100			
REFERRED	86	17		ϕ	/100
Correct-Referrals	82	16	100	0.97	95
Over-Referrals	4	1	1		5
NOT REFERRED	439	83		rt	
Under-Referrals	–	–	–	1.00	–
Non-Referrals	439	83	99		

* Methods used to determine criteria, discussion of statistical methods employed are discussed in Vision Screening for Elementary Schools.[6]

a. Tetrachloric (r_t) correlations not valid because of small number of referrals.

b. Less than 0.5%.

Table 3—1956 Effectiveness of Screening* (continued)

AGE GROUP 13-14-15	340	100			
REFERRED	63	19		ϕ	/100
Correct-Referrals	62	19	95	0.96	98
Over-Referrals	1	b	b		2
NOT REFERRED	277	81		rt	
Under-Referrals	3	1	5	1.00	5
Non-Referrals	274	80	100		

* Methods used to determine criteria, discussion of statistical methods employed are discussed in Vision Screening for Elementary Schools.[6]
a. Tetrachloric (rt) correlations not valid because of small number of referrals.
b. Less than 0.5%.

2. A qualified professional examiner should be utilized to provide the MCT[6] for all children at the first grade and for all new entrants into elementary school.

3. The examiner doing MCT should have a certificate of completion from an accredited school of optometry, or an M.D. degree with one year of specialized training in ophthalmology in an accredited training center, or two years of practical work in ophthalmology.

4. The professional MCT examiner should act as an employee of the agency responsible for the school health program and, even if part time, should not be in private practice anywhere in the region so that the economic interest of the examiner cannot become an issue.

5. Children who have had the MCT once, and who passed, should be tested annually thereafter only with the Snellen test. This will pick up the myopes who constitute nearly all of the group who fail in following years. Teacher observation should be done continuously. The Snellen testing and the reports of teacher observation, where feasible, should be completed prior to the annual visit of the MCT professional examiner. In this way, children failing the Snellen or referred by teacher observation could be screened by the MCT at the same time as the first graders are being examined and before being referred for private professional attention.

6. The Snellen[6] procedure should be carried out by a qualified individual, less highly trained than the professional MCT examiner, and hired by the school to do the work once each year. Such persons are likely to be available for the short periods of time involved. This would avoid significant costs for teacher training as well as for teacher screening.

7. Those children failing the MCT should be referred for professional vision attention. Criteria are given in Table 1 and suitable referrals and forms have been developed.[6]

8. The parents of those children with known visual problems in grades two and above should receive a reminder of the need for regular professional attention once each year without being screened. It is fair to say that children with vision problems change more and require the most frequent vision attention.

9. The school health education program should include formalized work on visual health. It should also impinge on the parents so that there will be family interest in getting regular professional attention for children with vision problems.

10. The school administrator should receive from the professional examiner an analysis of the cases referred. These should be compared to estimates which have been developed[6] which provide an administrative check on the effectiveness of the program. Significant departures should be studied carefully.

11. The multiprofessional steering committee should have the obligation of verifying the adequacy of the screening program, the absence of excessive under- and overreferrals, and should modify the referral criteria to meet local professional practices. They should also participate in developing the school visual health education program, without which much of the screening will not result in professional care for the children who are found to be needing it.

Table 4—Analysis of Costs of Screening

		1954	1955	1956
Number		1,163	1,475	1,274
1. Teacher observation 2. Nurse observation	Time and cost not calculated			
3. State recommended procedure				
a. Teacher preparation*		306	95	–
b. Teacher testing		118	81	–
c. Nurse preparation		197	18	15
d. Nurse testing		51	51	184
	Total hours	672	245	199
	Cost @ $3.50	$2,352.00	$857.50	$696.50
	Time per pupil	33 Min.	9.5 Min.	9.2 Min.
	Cost per pupil	$ 1.93	$ 0.55	$ 0.53
4. Telebinocular				
a. Nurse-technician preparation		–	5	14
b. Volunteer training		–	3	3
c. Nurse-technician testing		–	211	142
	Total hours	–	219	159
	Cost @ $3.50	–	$766.50	$556.50
	Time per pupil	–	8.5 Min.	7.3 Min.
	Cost per pupil	–	$ 0.49	$ 0.42
5. Massachusetts Vision Kit				
a. Nurse-technician preparation		4	–	4
b. Volunteer training		3	–	3
c. Nurse-technician testing		108	–	133
	Total hours	115	–	140
	Cost @ $3.50	$402.50	–	$490.00
	Time per pupil	5.1 Min.	–	6.4 Min.
	Cost per pupil	$ 0.33	–	$ 0.37
6. Modified Clinical Technique				
a. Volunteer training		2	2	2
b. Professional examiner testing		113	125	94
	Total hours	115	127	96
	Cost @ $6.00	$690.00	$762.00	$576.00
	Time per pupil	5.6 Min.	4.9 Min.	4.5 Min.
	Cost per pupil	$ 0.56	$ 0.49	$ 0.45

* Including prescribed six-hour training program.

Table 5—Projected Community Costs of Overreferrals—1956

Assuming $15.00 per Professional Examination	Overreferrals			Underreferrals	
	Number		Cost	Number	Per cent
Teacher observation	218	@ $15.00 =	$3,270.00	115	52
Nurse observation	4	@ 15.00 =	60.00	174	79
State recommended procedure	10	@ 15.00 =	150.00	166	75
Massachusetts Vision Kit	33	@ 15.00 =	495.00	91	45
Telebinocular	67	@ 15.00 =	1,005.00	89	44
Modified Clinical Technique	14	@ 15.00 =	210.00	4	2

Summary

1. A three-year longitudinal study of the vision status of approximately 1,000 elementary school children was completed.

2. Many different screening procedures were compared with one another and against clinical examinations. Clinical criteria were established from the study results and these compared favorably with professional opinions as obtained on a nation-wide questionnaire.

3. The Modified Clinical Technique was remarkably efficient, economical, and had the fewest over- or underreferrals.

4. Recommendations are given for conducting satisfactory elementary school vision screening.

5. The role of a health department in promoting research and evaluation in a disputed field involving several disciplines and interests is discussed.

6. Detailed review of the subject, data, analysis, discussion, criteria, technics, recommendations, and bibliography are available in a book published by the University of California Press entitled, "Vision Screening for Elementary Schools: The Orinda Study."[6]

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The material, charts, and tables represent a brief review of the entire study published by the University of California Press under the title, "Vision Screening for Elementary Schools: The Orinda Study."

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This paper was presented before a Joint Session of the Epidemiology, Health Officers, and Statistics Sections of the American Public Health Association at the Eighty-Sixth Annual Meeting in St. Louis, Mo., October 28, 1958.

Psychotherapy Association to Hold Annual Institute

The American Group Psychotherapy Association will hold its Fourth Annual Institute on January 27 and 28, 1960, at the Henry Hudson Hotel, 353 West 57th Street, New York, N. Y. Major topic of the meeting will be the group therapist—his personality, training, and functions. The 17th Annual Conference of this association will follow on January 29 and 30, 1960, at the same hotel. Program information from American Group Psychotherapy Association, Inc., 1790 Broadway, New York 19.

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Journal of Public Health

EDITORIALS

The Medical Research Council Reports

THE ANNUAL REPORT of the Medical Research Council of Great Britain[1] has recently been published and provides very interesting reading. In the first place, it tells us a great deal about the activities of the British government in this area. Second, it contains a survey of current trends in research which offers a number of items of interest to public health workers. The report reflects the continuing growth of medical research under governmental auspices. During the year seven new research units and groups were established, and it is worth noting the trend over the past two decades. In 1938 there were five units, in 1948 there were 39, and at the end of the period covered by this report there were 68. Within the last three years alone the council set up 21 new units.

As part of its work in tropical medicine, the council maintains three research establishments outside of Great Britain. The oldest and largest of these is in Gambia, West Africa; the others are in Uganda and Jamaica. Much of the work in Gambia has been concerned with the consequences of repeated malarial infection on the health of young African children. In addition to malaria, the work in Gambia deals with leprosy and trachoma. Although leprosy is no longer an endemic disease in Europe and in the United States, it is still a major health problem in many parts of the world. The areas now chiefly involved are Africa, Southern Asia, and South America. Recent estimates suggest that there are 10 to 15 million cases of leprosy in the world at present. While it is not yet possible to cultivate the leprosy bacillus or to transmit it to animals, some advance is being made with rat leprosy, which resembles the disease in man. Somewhat greater progress is reported for trachoma. For the first time, the conjunctiva of a blind volunteer was inoculated with African virus, and typical trachomatous lesions of the conjunctiva were induced and confirmed by histological examination. This experiment provided proof that the African strain of virus is etiologically related to trachoma. Work is also being pursued on the development of a trachoma skin test for the diagnosis of clinically doubtful cases.

Further interesting items are contained in the sections on research in general practice and on rehabilitation of chronic schizophrenics. There is a widespread feeling that research in general

practice may make substantial contributions to medical knowledge if proper methods and conditions are developed. The Epidemiological Research Unit of the council has so far concentrated on (1) study of the various kinds of illness in practice as an index of the pattern of disease in a general population, and (2) more intensive study of certain specific diseases, including follow-up of cases, when necessary outside the limits of the individual physician's practice. A survey of acute otitis media in general practice was made in 1957. Among the interesting results was the finding that 99 per cent of the cases were seen only by general practitioners. One wonders what the findings would be in the United States.

The council's Social Psychiatry Research Unit has been involved since 1954 with the study of the psychological and social processes involved in the retraining of chronic schizophrenics and bringing about their resettlement in the general community. In a follow-up study of 240 male chronic psychotic patients discharged after an unbroken stay of at least two years, information was obtained on 229 of them by means of an exhaustive interview schedule. Two out of three of the patients had succeeded in remaining out of the hospital for at least a year, and of these, two out of three were judged to have achieved a satisfactory level of social adjustment. Interestingly enough, it was found that those who went to live with their parents did worse, even allowing for the fact that some of these patients were in a manifestly abnormal state, while those who lived with their wives, with other relatives, or with landladies did better in that order. Research of this kind is not only interesting from a theoretical point of view but has practical consequences.

1. Report of the Medical Research Council for the Year 1957-1958. London, England: Her Majesty's Stationery Office, 1959.

Some Consequences of an Increased Life-Span

CONTINUING developments in science and technology, notably in public health and medicine and the rising standard of living of many populations throughout the world, are altering the demographic perspectives of life. While less apparent than changes in technology, the shifts in attitude and behavior due to an increased life-span will eventually alter many social patterns and expectations. In fact, this is already happening and the consequences for community life are already beginning to make themselves felt. As Jean Fourastié[1] recently pointed out, the meaning of certain vital events are being changed radically in a psychological sense. Among these may be noted not only the mean duration of life, but also age at marriage, duration of marriage, number of children, number of deaths, and the age at which children become independent and self-supporting. This comparison is particularly striking if one compares the current situation with that which existed two or three centuries ago. A population composed of individuals, of whom large numbers achieve an age of 70 to 75 years is very different from a population in which one out of two died before the age of 21 or even 16. Formerly, the mean age of children at the death of one parent was 14. Marriages were contracted earlier and lasted on the average less than 20 years. In France, during the period 1680-1720, the mean was 17 years, and for the period 1750-1780, 19 years. Today, it is almost 50 years. Traditionally, parents died before the education of their youngest children was completed. Now, a normal couple will survive the marriage of their youngest child by 15 to 20 years. Today, the "average" son may be 55 to 60 years of age at his father's death. In short, a number of problems of an aging population must be seen in

this frame of reference. It means that the traditional hierarchy of the age classes is changing and reveals the profundity of the developments that mankind is experiencing as a result of technical change. Here is a large area of investigation where the demographer, the social scientist, and the public health worker can join forces in order to throw more light on these continuing changes and their significance for the physical and mental health problems of tomorrow.

1. Jean Fourastié. De la vie traditionnelle a la vie "tertiaire." Recherches sur le calendrier démographique de l'homme moyen (From the traditional life pattern to a "tertiary" one. Research on the demographic time-table of the average man), Population 14:417-432, 1959.

Florence Kelley (1859-1932): Architect of a Better World for Children

IF THE UNITED STATES is today, in considerable measure, a better place for children to be born and live in, it is due in large degree to Florence Kelley. According to Justice Frankfurther, she was "a woman who probably had the largest single share in shaping the social history of the United States during the first thirty years of this century."[1]

Much of the public health work and social legislation that we take for granted today—prenatal care to reduce infant and maternal mortality, child labor laws, industrial health programs, the establishment of minimum wages and maximum working hours—were causes for which she fought and which she helped to bring into being during her active life. Today, the reforms for which she labored are accepted elements of the social scene and the memory of those like Florence Kelley, who struggled to achieve them has been almost forgotten. But as Lillian Wald wrote 25 years ago: "It will be a sad loss to America if the story of that ardent crusader is not retold to coming generations, for her times knew none more effective."[2]

Florence Kelley, after working at Hull House, became the first chief inspector of factories for Illinois and later general secretary of the National Consumers League. Together with Lillian Wald, she developed the idea for a Federal Children's Bureau. As early as 1900, Mrs. Kelley in a series of lectures on child labor proposed a national commission to deal with such matters of immediate urgency as infant mortality, birth registration, orphanage, child labor, desertion, illegitimacy, and degeneracy. In 1903, Miss Wald suggested the Federal Children's Bureau, and the matter was brought to the attention of President Theodore Roosevelt who promised his support. Finally, after years of agitation, argument, and publicity, the necessary legislation establishing a bureau was passed in 1912. Today it is difficult to understand the resistance to the establishment of this agency which has done so much for America's children.

When the bureau was established Florence Kelley proposed that it turn its attention to infant mortality. Eventually this led to the passage in 1921 of the Maternity and Infancy (Sheppard-Towner) Act. She had a sharp and eloquent tongue, and when the passage of this bill was delayed she wanted to know "Why does Congress wish mothers and babies to die?" She was intolerant of superficiality, selfishness, and inaction. Lillian Wald relates that once when she was "trying to apologize for a woman who . . . disappointed those who had expected much of her, saying, 'Well, she has an open mind.' 'That's what I object to,' flashed Florence Kelley. 'It's open top and bottom.' "[3]

One of her last achievements was to stimulate the investigation of the use of

radium in luminous paint. Eventually she helped to put a stop to the poisoning, and death from poisoning of dial painters in watch factories. Thus, the hazards of another lethal industrial poison were overcome.

Florence Kelley died in 1932 at the age of 74. She was a member of that dedicated, militant group of men and women who at the end of the nineteenth century and during the first quarter of the present century undertook to curb the abuses of industrialization and prepared the way for the social legislation of the present. The drive behind this activity was not self-interest but social conscience. The public health of the present and the future needs men and women like Florence Kelley, and in this centennial year of her birth we would do well to reflect on the accomplishments of and take inspiration from this pioneer of social reform.

1. Felix Frankfurter. Foreword, in Impatient Crusader by Josephine Goldmark, Urbana, Ill.: University of Illinois Press, 1953, p. 5.

2. Lillian D. Wald. Windows on Henry Street. Boston, Mass.: Little, Brown, 1934, pp. 42-43.

3. Wald, op. cit., p. 43.

The Future of Preventive Medicine

"Looking into the future we must admit that healing will no longer be the main task of the physician although still a very important one. Medicine must by necessity become preventive medicine. There is no point in letting people break down and suffer from preventable diseases. There are enough sources of suffering in the world that may not be prevented so easily. The major tasks of medicine will be the maintenance and promotion of health, the prevention of disease, healing when prevention has broken down, and finally the social rehabilitation or reintegration of the former patient into society."—Henry E. Sigerist, M.D., 1955.

THE ALBERT LASKER AWARDS FOR 1959

Nineteen hundred and fifty-nine marks the 14th annual presentation of the Albert Lasker Awards by the American Public Health Association. The Lasker Awards are given by the Albert and Mary Lasker Foundation to individuals and groups for outstanding contributions in research related to diseases which are the main causes of death and disability and for distinguished service in the field of public health administration.

The Awards were conceived not only to honor the recipients and to dramatize their accomplishments, but also to arouse increased professional and public interest in medical research and public health administration and to aid in the rapid dissemination of vital new health information to the peoples of the earth.

Since their founding in 1946 the Albert Lasker Awards of the American Public Health Association have come to be regarded among the nation's primary medical honors. Ten of the recipients have later received Nobel Prizes.

The Award consists of a statuette of the Winged Victory of Samothrace, a beautiful leather-bound, illuminated citation, and a check for $2,500. A stipend of $5,000 accompanies the Special Award.

The Awards for 1959 were presented at the Second General Session of the Association's Annual Meeting in Atlantic City, N. J., October 22. Recipients and their citations are:

Charles E. Smith, M.D., dean of the University of California School of Public Health, and chairman of the Awards Committee, assisted by Leona Baumgartner, M.D., President, American Public Health Association, presented the citations.

AWARD IN MEDICAL RESEARCH

Albert Coons, M.D.

One of the most widely used of the newer technics in immunology and pathology is **Dr. Albert Coons'** fluorescent method for the identification and localization of antigens and antibodies in tissues. A major invention in medical science during the past two decades, this tool has greatly broadened our knowledge of how the body reacts to infection.

Through this ingenious technic, Dr. Coons and his associates succeeded in making antibodies visible under a special ultraviolet microscope by tagging them with fluorescent dyes. Because antibodies react only with a specific invader, the new method has made it possible to identify a virus by tracking its attached antibody under the ultraviolet beam of the microscope.

With this technic, Dr. Coons and his associates have been able to identify the plasma cell as the principal unit engaged in antibody formation and to prove the importance in antibody production of the regional lymph nodes draining the site of antigen injection. Furthermore, his studies have indicated the probability that individual plasma cells produce antibody against only a single antigen.

Through the research of Dr. Coons, knowledge has been advanced with respect to many obscure diseases and phenomena of disease. His achievements have already been recognized by his selection to be a career investigator of the American Heart Association and a visiting professor of bacteriology and immunology at Harvard University. To these honors is now added an Albert Lasker Award in Medical Research by the American Public Health Association.

AWARD IN MEDICAL RESEARCH

Gilbert Dalldorf, M.D.

Few in research have the distinction of having contributed highly important information in two quite different fields, and twice, broadly and significantly, in one of them.

Dr. Gilbert Dalldorf is in this unique position. In his chosen discipline of pathological anatomy his early studies were of the morphological changes associated with deficiency disease. These were made at a time when the subject was new and its broad implications rarely recognized.

Somewhat later, while carrying heavy general responsibilities, he made the unique observation of "interference," the ability of infection with one virus to modify the course of another. The pertinence of this discovery to our basic understanding of virus infection, the constitution of viruses, and of the potential therapy of virus infection was great. It becomes greater almost daily, thirty years after the original observation.

More recently, again while carrying major responsibility in a different setting, he made a second revolutionary contribution to virology. By the inoculation of diseased tissue into very young animals Coxsackie virus was uncovered, and so a new disease entity defined. This was not only an important clarification of a medical mystery; the procedure employed opened to productive study the great field of tissue immunity, gave us new means for tissue transplantation, and broadened modern virology and cancer research.

The example provided by this patient and devoted scientist will long stand as a model for the investigator of the future.

AWARD IN MEDICAL RESEARCH

Jules Freund, M.D.

The stature of **Dr. Jules Freund** as a pioneer in the immunology research of our own era makes him a most distinguished recipient of this award for achievement in medical research. His contributions have been many and notable in shedding light upon the hitherto little-understood mechanisms of allergy and, as well, in the field of immunological agents and vaccines.

Internationally famed among the ranks of medical scientists, Dr. Freund has, through his research, clarified and added greatly to knowledge on immunization against tuberculosis, malaria, rabies, and poliomyelitis, among other diseases. Technics of scientific study developed by him have advanced knowledge in basic immunology and have provided tools used routinely in laboratory research by immunologists throughout the world today.

The significance of Dr. Freund's studies to preventive medicine may be discerned in several important developments. For example, in early investigations of poliovirus vaccines made from brain tissue, it was demonstrated that brain tissue virus produced antibody responses only with the aid of an adjuvant or auxiliary agent developed by Dr. Freund and known as the Freund adjuvant. Another area influenced by his findings is that of adjuvant influenza vaccine, which holds much promise for the future.

AWARD IN PUBLIC HEALTH

John Holmes Dingle, M.D.

As director of the Commission on Acute Respiratory Diseases, Armed Forces Epidemiological Board, and as professor of preventive medicine, Western Reserve University School of Medicine, **John Holmes Dingle, M.D.**, conceived and carried forward a broad investigative program bearing on all aspects of acute infections of the respiratory tract, including influenza, pneumonia, and the common cold.

The critical and comprehensive studies that he initiated and guided were brought to effective conclusion by carefully selected and highly trained groups of investigators with widely diverse professional backgrounds and interests. No more thorough or systematic investigation of acute respiratory diseases has ever been undertaken and none has been more productive of new knowledge.

Throughout the last two decades the work of Dr. Dingle and his colleagues has brought new understanding of several disease entities which previously were grouped together merely as undifferentiated acute respiratory infections. It has shed new and revealing light on the specific infections included in the syndromes designated as primary atypical pneumonia, acute respiratory disease, nonbacterial pharyngitis and the common cold. It has led to the development of effective prophylactic procedures which make feasible the prevention of some acute respiratory diseases and raises the possibility that others can be brought under control for the enduring benefit of mankind.

AWARD IN PUBLIC HEALTH

Maurice Pate

From his birthplace in Pender, Neb., **Maurice Pate** moved early in life into world-wide activities. Graduation from Princeton University was followed by army service overseas and then by several years of association with Herbert Hoover in war relief work in Belgium and Poland.

A career in international commerce was followed by again accepting the challenge of intense human need as president of the Commission for Polish Relief in 1939. He continued in similar international service until appointed executive director of the United Nations International Children's Emergency Fund in 1947. Under his administration this organization has grown steadily in meeting the world-wide health needs of children and mothers and in the development of respect and good will toward all mankind.

Populations everywhere can understand the mission of UNICEF:

(1) supplies and equipment for maternal and child health centers;
(2) nutrition programs including milk distribution, dairy plant construction, school feeding, nutrition education, and improved local food resources; and
(3) direct disease control programs including antimalaria campaigns ($8 million and reaching about 25 million persons annually in this work alone, in 1958-1960), DDT production and distribution, penicillin production and distribution, control measures for leprosy, yaws, tuberculosis, and trachoma, and improvements in sanitation.

Now changed in name to the United Nation's Children's Fund, the steady growth in voluntary financial support of UNICEF and the strength of its long-range program conducted in cooperation with the World Health Organization, the Food and Agriculture Organization and other agencies reflect both the spirit and the rare administrative ability of the executive director.

SPECIAL AWARD FOR EXTRAORDINARY PUBLIC SERVICE

Senator Lister Hill

The name of **Lister Hill,** senior senator from Alabama, will shine brightly on the pages of history because of his pre-eminence in and his tireless dedication to the fostering of medical, dental, and biological research and to the expansion of our nation's hospital and health research facilities. The people of this country, living and yet to be born, will ever be indebted to Senator Hill for his courageous leadership also in the fields of education, housing, and welfare which bear so vitally on the health and happiness of every individual.

In nearly a half-century of public service, Senator Hill has applied himself untiringly to efforts for health progress. His contributions include co-sponsorship of the Hill-Burton Act which has added over 120,000 hospital beds in communities throughout the nation; the Research Facilities Construction Act which authorizes $30 million dollars a year for matching grants-in-aid in the construction of facilities for research in the life sciences by institutions throughout the country; co-sponsorship of the measure establishing the National Institutes of Health which today includes institutions for research into cancer, heart diseases, mental health, allergy and infectious diseases, arthritis and metabolic diseases, neurological diseases and blindness and dental ailments.

Seeking still further to carry medical research to its logical dimensions, Senator Hill introduced the "Health for Peace Act" which would set up an International Medical Research Institute to carry out specific programs and coordinate research throughout the world for a "common attack and a common advance against the crippling killers of mankind."

Son of a great physician, named for another great healer, Lister Hill has proved himself a statesman of world stature. The American Public Health Association is proud to bestow upon Lister Hill, the Albert Lasker Award for extraordinary public service in the United States Senate.

SPECIAL AWARD FOR EXTRAORDINARY PUBLIC SERVICE

Congressman John E. Fogarty

The distinguished service to public health rendered by **Congressman John E. Fogarty** of Rhode Island is noteworthy both for public recognition and for the acclaim of scientists and organizations concerned with the conduct and support of medical research for the people's benefit.

Championing the advancement of medical and dental research and of public health, Mr. Fogarty has, indeed, won wide recognition along the whole range of interests devoted to medical and biological research. America's great national voluntary health agencies and her esteemed scientific community of professional societies know him well. Together with the people of his own state and the national public, they place high value upon his incessant efforts to further the nation-wide—and burgeoning world-wide—attack through research upon diseases which are the main cause of death and disability.

Over a score of years, Congressman Fogarty has given unstintingly of himself in public service. In this long service, his leadership in the House of Representatives of the United States Congress is responsible for many landmarks of progress in advancing the support of medical research. The expanded attack of the National Institutes of Health on our major diseases owes much to Congressman Fogarty. He has also been especially concerned with

the plight of our sick, crippled and mentally retarded children. He has recognized that medical research is world-wide in its needs and potentialities through his co-sponsorship of the International Medical Research Act.

It is an honor for the American Public Health Association to present the Albert Lasker Award to Congressman John E. Fogarty for his splendid service to the people of this nation.

Presidential Citation

Presented on October 22, 1959, at the Eighty-Seventh Annual Meeting of the American Public Health Association

Mary Woodard Lasker

To Mary Woodard Lasker—Lovely Lady who, with so many skills, so many charms, could succeed in any one of a dozen worlds. But fortunately for her fellow men she had a dream, and she set about with her husband's help to make that dream come true. It was the dream of how sustained and adequately financed research could add to human happiness through preventing disease and disability.

Once many years ago another dreamer of better things to come, Mr. H. G. Wells, wrote "Scientific truth is the remotest of mistresses; she hides in strange places, she is attained by tortuous and laborious roads, but she is always there! Win to her and she will not fail you; she is yours and mankind's forever. She is reality, the one reality I have found in this strange disorder of existence. She will not sulk with you nor misunderstand you nor cheat you of your reward. . . . You cannot change her by advertisement or clamor, nor stifle her in vulgarities. Things grow under your hands when you serve her, things that are permanent as nothing else is permanent in the whole life of man. That, I think, is the peculiar satisfaction of science and its enduring reward."

In bestowing upon Mary Woodard Lasker the Presidential Citation for 1959, the American Public Health Association honors itself and hopes she, too, will find in her support of medical science, this same "peculiar satisfaction," this "one reality," this "enduring reward." You have made the Winged Victory the symbol of your dream. May this small charm with its own replica of your symbol remind you of the affection, the admiration, and the gratitude of us all for the way you have chosen to set your imprint on the present and the future.

ASSOCIATION NEWS

Sedgwick Memorial Medal for 1959

LOUIS I. DUBLIN, Ph.D.

It is the privilege of the Association to bestow this medal for distinguished service upon an elder statesman whose contributions to the advancement of public health practice in this country and abroad are extensive and noteworthy. As a member of this Association for the past forty-seven years and as a Charter Fellow since 1922, the recipient has not only contributed to the advancement of the Association as a professional leader, emphasizing the importance of the individual in the conservation of human life and energy, but through his steadfast adherence to the principles upon which our Association was organized. It has been his privilege to render distinguished service as an officer, as a member of committees, and as a worker in the ranks of the American Public Health Association.

Louis I. Dublin, Ph.D., was born in New York City where at an early age he recognized that without a fundamental concept and knowledge of health problems it would be quite futile for man to struggle with the increasing mortality and morbidity from preventive causes which hindered him in the inevitable adjustment to his environment. Following graduation from the College of the City of New York, Dr. Dublin received his graduate degree in biology at Columbia in 1904 and taught mathematics in the College of the City of New York during the next seven years.

He joined the pioneering group of health men at the Metropolitan Life Insurance Company in 1909 and two years later organized the Statistical Bureau and remained as its chief until his retirement as vice-president and statistician of the company in 1952. With foresight, Dr. Dublin approached the problems of mortality, morbidity, and longevity in an ever-changing population. It has been his good fortune to enjoy a life span which has covered the determined struggle against the communicable diseases and has now entered new areas dealing with chronic illness and long-term disability, problems of the increasing portion of our population beyond the age of sixty. He witnessed and contributed to the reduction in the toll of death from tuberculosis, the heart diseases, cancer, and accidents. He has enjoyed the rare but determined combination of the scholar and the administrator. He early realized that a successful public health

The citation was presented by Henry F. Vaughan, Dr.P.H., of the University of Michigan School of Public Health, Ann Arbor, Mich., at the Eighty-Seventh Annual Meeting of the American Public Health Association, October 20, 1959.

administrative program must be constantly reconciled to changing causes of disability and death. Untold numbers in this vast country of ours are indebted to Dr. Dublin for his tenacity and determination to limit and ultimately conquer the preventable diseases and add to the length and wholesomeness of human life. His approach was to begin with factual data and to end with the education of the individual and the community, thus creating a chain of events which of necessity would spell better health for the mass of the people.

Dr. Dublin's contributions and writings are so extensive that they cannot be a part of this brief statement. We would, however, be remiss if we omitted some of the highlights of his professional career showing his broad approach and interest in matters of health. Dr. Dublin was President of the American Public Health Association in 1932, but prior to that as a member and chairman-secretary of the Committee on Administrative Practice, together with C.-E. A. Winslow, Frank Walker, Carl Buck, and others, he assisted in the preparation of that indispensable measuring stick, the "Appraisal Form," with which the progress of health work was measured in terms of time and space. This committee provided a means for the wide expansion of the newer technics in health practice through local, state, national, and international health agencies, both official and voluntary.

Dr. Dublin served as a member of many other important committees of the Association, including several terms on the Executive Board, as an officer of the Statistics Section, and as treasurer of the Association for most of the years extending from 1925 to 1949. He was also chairman of the Board of Directors of the American Museum of Health which created the Hall of Man at the New York World's Fair in 1939-1940.

Dr. Dublin had the good fortune to open channels through other organizations which gave further expression to the health programs of our Association. He served as president of the American Statistical Association. He has been a consultant to the Bureau of the Census, the Public Health Service, the National Research Council, and the Veterans Administration. His interests have indentified him with a number of voluntary health agencies on whose boards he served; prominent among them are the American Cancer Society, the National Tuberculosis Association, the National Health Council, and the National Foundation. During World War II he was entrusted with special assignments by the American Red Cross, for which he served as a special emissary and assistant. At the conclusion of the war, the Armed Forces asked for his services in Hawaii which he freely gave.

Since his retirement from the Metropolitan in 1952 he has served as consultant on health and welfare to the life insurance industry. In this new activity he has stimulated many thousands of life underwriters to advance the public welfare in their own communities.

His contributions to literature, as represented by his writings and addresses, list some 660 items. These by no means constitute all of his innumerable contributions to the cause of health advancement. One could really know Dr. Dublin only through close contact with him in committee work and in laying plans which would promote new patterns for the conservation of life. To his friends it has been a joy and a privilege to know him. As an individual, his personality brims with enthusiasm, devotion, and determination to do what in his judgment is best in the interest of good health. We are truly honoring ourselves by awarding the Sedgwick Memorial Medal to him, by bestowing this professional symbol upon our fellow member, Louis I. Dublin.

Response by Dr. Dublin

I am, of course, delighted with this evidence of your appreciation. My old friend, Henry Vaughan, has done his duty very graciously and generously. I am not inclined to quarrel with his overstatements and I am grateful. But I am under no illusion as to who is the real hero of this occasion. Tonight, we celebrate the life and work of a great man, a great public health pioneer, and a great teacher. I hope we will continue this custom for many years.

A brief reference to Sedgwick's training and career is in order. After graduating from the Sheffield Scientific School at Yale and a year of medical school, Sedgwick went to Johns Hopkins University for his graduate studies in biology. Here, the very atmosphere was charged with exciting activity. President Gilman and his brilliant faculty were raising American university standards to the level of the best in Europe. In biology, it was Newell Martin, Huxley's associate; in chemistry, Remsen; in mathematics, Sylvester; and in physics, Rowland. These were all stars of the first magnitude. The emphasis was on creative research and on the training of scientific leaders. Under the influence of Martin, Sedgwick decided on a career as teacher and investigator. He took his doctorate in 1881 and was associate in biology for the next two years. He was called to the chair of biology at the Massachusetts Institute of Technology in 1883 and here he served and grew in stature as the professor and researcher in biology until his death in 1921.

But with Sedgwick, as with Huxley and Martin, whose scientific outlook he absorbed, biology embraced the entire field of life, including man and his relation to the world about him. Here was no run of the mine professor of biology; he was cut out for greater things. He was indeed fortunate in his time and in his location. Pasteur and Koch and their associates had opened up a new era in bacteriology and disease prevention and Sedgwick was quick to see the implications of their work, located as he was in a school of practical engineering. He soon began his lectures on bacteriology and learned the necessary technics of the new disciplines. His first great opportunity came in 1888 when the Massachusetts State Board of Health had the wisdom to turn to a university scholar and appoint him consulting biologist to the Lawrence Experiment Station, established by the State Board of Health. Here, he and his students began those investigations of the problem of the water supply and of sewage disposal which revolutionized sanitation throughout the country. It was in 1890 that he made his famous study of typhoid fever in the Merrimac Valley which led to the now universal practice of filtering public water supplies. From this point on, he was more and more launched in the direction of public health work. The transition was natural enough.

I need hardly refer to the long list of his publications. They have illumined every aspect of the public health movement. What I want to emphasize is that throughout his career he was fundamentally the well trained biologist, prepared to adjust his methods and approaches as required by the material at hand.

Perhaps the greatest contributions which Sedgwick made were his students —a host of men, broadly trained like himself in the basic scientific disciplines. His department at MIT became a veritable factory for the creation of leaders in every branch of biology and public health. These were men who concerned themselves with fundamental problems and trained the new army of workers in every area of the country. I need mention only such names as Whipple, Prescott, Jordan, Winslow, Calkins, Gunn

and, of course, our own Henry Vaughan. The number of competent men and women who left his laboratory to fill important places throughout the country is legion.

My own indebtedness to Sedgwick began early in my life, in fact, close to sixty years ago. Some of you older members will remember that I, too, entered public health by way of biology. I studied with E. B. Wilson, Sedgwick's colleague at Yale and at Johns Hopkins, and who, like Sedgwick, carried the Hopkins tradition of broad basic training and research along with him to Columbia. My first manual was Sedgwick and Wilson's "General Biology"; my first preceptor at the university was Gary Calkins, one of Sedgwick's students. These two men made me aware of the contributions of Sedgwick and his school, and the part a biologist can play in the public health movement. My first real opportunity in this field came in 1909 when I joined the Metropolitan's newly opened Health and Welfare Department. The rest, covering the next fifty years, is history. But I must not forget to mention an early contact with Sedgwick which proved significant. It was in January, 1915, that I published a study entitled "Typhoid Fever and Its Sequelae," in our American Journal of Public Health. Sedgwick immediately wrote me one of those letters for which he was famous. One sentence was particularly significant. He said that the method of following up the life history of a group of individuals with a disease or impairment by actuarial methods should be applied more generally in our health studies and that, in fact, I had done much better than I realized. Coming early in my career, this letter made a deep impression on me and many subsequent studies from my workshop at the Metropolitan were along these lines.

What is the significance of Sedgwick for us today? Our growing population and our increasing interest in the health and welfare of the people of the underdeveloped areas of the world will call for a huge number of competent workers in the fields of medicine and disease prevention. I am confident that we shall meet this challenge for a great variety of technicians in the various branches of public health work. What I hope we will not forget is to make provision for an adequate supply of top leaders who, like Sedgwick, will have the broadest possible scientific and cultural background to organize and direct the health forces of the world. We shall need more and more men who, like him, will be prepared to conduct the necessary basic researches to solve the many emerging problems in the health field, including those which involve human behavior and related social and economic issues. Such men will see in public health not only so many technics, specialties, and devices but rather an approach toward better human relations and higher standards of life for people everywhere.

We celebrate the life and work of Sedgwick tonight to impress this need on all of us.

RESOLUTIONS

The following resolutions were adopted by the Governing Council, American Public Health Association, at its Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 21, 1959.

Research on Causes of Death

WHEREAS, there are inadequate national data regarding the relationships of mortality to social, ethnic, and economic circumstances, including income, occupation, education, and housing, and

WHEREAS, additional and current information on the relationship of these and other environmental factors to mortality would contribute greatly to programs of the Public Health Service and the many organizations outside government, concerned with cancer, heart disease, and other chronic illnesses, and

WHEREAS, the major source of information on mortality is the death certificate, which is restricted to a few salient descriptive items about the decedent, and which does not include many of the items necessary to study the relationships of environment and mortality, and

WHEREAS, in the 1960 Decennial Census of Population and Housing, a wide range of environmental facts will be collected for persons alive at the time of the census thereby presenting a unique opportunity for determining these characteristics for persons who die after the census, therefore be it

RESOLVED, that the American Public Health Association urge the Public Health Service of the U. S. Department of Health, Education, and Welfare to obtain (1) social, economic, ethnic, occupational, and residence information from census records for persons who were enumerated in the census and died shortly after the census, and (2) comparable data from the Bureau of Census for the population as a whole as needed to compute reliable mortality rates, and be it further

RESOLVED, that with this information studies be conducted by the Public Health Service on the relationship between the various causes of death and environment.

Full-Time Direction of Accident Prevention Programs in State Health Departments

WHEREAS, accidents which cause more than 90,000 deaths per year are the fourth cause of all deaths in the United States and the first casue of death in age groups one through 35, and

WHEREAS, injuries resulting from accidents are of even greater consequence than the aforementioned deaths, and

WHEREAS, much existing knowledge concerning the prevention of accidents and accidental injuries is not being applied and many gaps in our knowledge as to the causes and prevention still exist, and

WHEREAS, the programing of accident prevention activities has been retarded by the lack of full-time personnel assigned to accident prevention, therefore be it

RESOLVED, that the American Public Health Association again request all state health departments to inaugurate and maintain accident prevention programs, including accident prevention research, and be it further

RESOLVED, that each state health officer appoint one or more full-time staff members to promote, develop, and coordinate accident prevention projects and activities with adequate financial resources.

Migratory Labor

WHEREAS, studies in various parts of the country disclose great need for the development of comprehensive health services to the migratory worker and his family, especially the migratory farm worker, in concert with other community services, such as those for welfare, education, and employment, therefore be it

RESOLVED, that the American Public Health Association recommend the establishment of Governors' Advisory Committees on Migratory Labor composed of individuals best informed about the fields of health, housing, welfare, education, and employment, and be it further

RESOLVED, that the American Public Health Association request the President and the Congress of the United States to provide adequate financing for the continuation and strengthening of federal services through the Department of Health, Education, and Welfare directed to migratory workers and their families, including grant-in-aid programs to appropriate state agencies.

Adjustment of Fluorides in Water Supplies

WHEREAS, fluorides at optimum levels in water supplies have been proved repeatedly to be a safe, effective, and practical means of substantially preventing dental caries, and

WHEREAS, in this country virtually all scientific and professional organizations having competence in the field, advocate the adjustment of the fluoride content of water supplies to recommended levels, and

WHEREAS, the institution and continuance of community-wide fluoridation programs depend largely on public understanding and acceptance of this measure, therefore be it

RESOLVED, that the American Public Health Association vigorously support and recommend the adjustment of the fluoride content of water supplies as a progressive health measure, and be it further

RESOLVED, that the American Public Health Association urge all health authorities to give high priority to public education on water fluoridation, and be it further

RESOLVED, that the American Public Health Association call upon all health agencies and professional and civic groups to intensify their efforts toward this end.

Financial Assistance to Educational Institutions

WHEREAS, there is a critical need for additional support for existing educational facilities and for the development of expanded or new facilities for the preparation of physicians, dentists, and other professional personnel in the health field, and

WHEREAS, there is a critical need for increased recruitment of competent persons to this field, therefore be it

RESOLVED, that the American Public Health Association endorses and supports sound federal legislation to provide financial assistance to qualified educational institutions to secure the physical facilities needed and scholarships to individuals as means of recruitment of needed personnel.

Legal Responsibility for Protection Against Unnecessary Ionizing Radiation

WHEREAS, ionizing radiations and their sources if properly utilized can be instrumental in the improvement of the health and welfare of the public, and

WHEREAS, ionizing radiations and their sources may be destructive or detrimental to life or health if carelessly or excessively employed, therefore be it

RESOLVED, that the American Public Health Association recommend to states the adoption of legislation which:

(a) declares a public policy concerning ionizing radiation;

(b) designates the health department as the official agency to manage the program;

(c) authorizes an advisory body of experts to guide the official agency;

(d) provides for the registration and regulation of potentially hazardous radiation sources; and

(e) provides for consultation with the Public Health Service to the end that uniform standards and practices be maintained throughout the United States.

Program Grants for Water Pollution Control

WHEREAS, effective water pollution control is essential to the health, comfort, welfare, progress, and development of the Nation; and

WHEREAS, the Federal Water Pollution Control Act provides grants for a five-year period beginning with the 1957 fiscal year to assist states and interstate water pollution control agencies to extend and improve programs; and

WHEREAS, despite extraordinary efforts by the states, the rate of construction of needed municipal, industrial, and other pollution abatement facilities is falling short of that needed to correct obsolescence and to provide new waste treatment facilities, and

WHEREAS, the withdrawal of federal program grants is likely to result in a serious delay in reaching water pollution control objectives, and

WHEREAS, congressional authorization for program grants under the federal Water Pollution Control Act expires on June 30, 1961, therefore be it

RESOLVED, that the American Public Health Association, petition the Congress of the United States to increase the appropriation for and to extend federal program grants authorization, and be it further

RESOLVED, that the measures for the control of water pollution be strengthened.

Data on Composition of Products for Poison Information and Control Centers

WHEREAS, poison information and control centers must maintain index files with up-to-date information regarding toxic constituent

substances which may produce accidental poisoning, and

WHEREAS, the National Clearinghouse for Poison Control Centers is unable with present resources to assemble all the information needed for these indexes, and

WHEREAS, there is particular need for adequate information regarding the constituent elements of cosmetics and household components, therefore be it

RESOLVED, that all concerns and industries which manufacture these products be urged to release routinely to the National Clearinghouse for Poison Control Centers detailed information regarding composition of their products and percentages of constituents in advance of appearance on the market, and be it further

RESOLVED, that national industrial associations be urged to collaborate in this effort, and be it further

RESOLVED, that the relevant federal agencies and the appropriation committees of the United States Congress be urged to provide the National Clearinghouse for Poison Control Centers with the financial and administrative resources necessary to prepare and distribute comprehensive listings of information about toxic constituents of manufactured products.

Support of White House Conference on Aging

WHEREAS, the President of the United States has announced that a White House Conference on Aging is to be held in Washington in January, 1961, and

WHEREAS, there is a great social wastage of skills and talents among the aging, and

WHEREAS, this wastage is in part the result of physical disability which has a high incidence among the elderly chronically ill, and

WHEREAS, the health needs of the aged encompass a broad spectrum of services, including psychological and social factors as well as biological ones, therefore be it

RESOLVED, that the American Public Health Association declares its support for the White House Conference on Aging of 1961 and offers the expert resources of the Association in the preparatory work and in the conference itself.

Expansion of Rehabilitation Services for the Chronically Ill

WHEREAS, the health services are rapidly expanding the knowledge of care, rehabilitation, and secondary prevention of disability of the chronically ill of all ages, and

WHEREAS, further health services in rehabilitation need to be developed for the care of the chronically ill throughout communities in the United States, and

WHEREAS, state and local health departments have special competence in dealing with the total health problems of the individual, including the medical aspects of rehabilitation, therefore be it

RESOLVED, that the American Public Health Association is convinced that it is essential that any legislation concerned with medical rehabilitation services encourage the greatest possible degree of participation by state and local health agencies.

Career Guidance in the Health Field

WHEREAS, shortages of health personnel are severe in almost all categories, and

WHEREAS, the Health Careers Program of the National Health Council can and will contribute to the alleviation of this shortage of personnel, therefore be it

RESOLVED, that the American Public Health Association does endorse and support the activities of the Health Careers Commission sponsored by the National Health Council.

Encourage Establishment of Diagnostic and Treatment Centers in Rural Areas

WHEREAS, Title VI of the Public Health Service Act, as amended, provides in part for federal grant-in-aid to construct diagnostic and treatment centers, and

WHEREAS, the act, as amended, stressed the need for diagnostic and treatment centers for those areas which would otherwise be without availability of medical care, and

WHEREAS, rural areas of the country require such facilities to attract physicians to provide medical care, and

WHEREAS, there has been practically no expenditure of available federal grant-in-aid for diagnostic and treatment centers in rural areas because of the technicality that applicants to be eligible must own or operate a hospital, therefore be it

RESOLVED, that subsection (e) of section 654 of the Public Health Service Act, as amended, be deleted so as to encourage the construction of diagnostic and treatment centers in rural areas by providing eligibility of application for existing federal grant-in-aid by nonprofit corporations at the local level through deletion of the eligibility requirement that such applicant own or operate a hospital.

Health Services Facilities

WHEREAS, certain desirable health services facilities, including consumer-sponsored, nonprofit, prepaid, group practice clinics, unaffiliated with any hospital, are at present excluded from federal financial support, and

WHEREAS, such nonprofit groups provide services that generally have stressed preventive services and rehabilitation, prevented much unnecessary hospitalization, provided basic economies in medical services, and extended the scope of high quality health services, and

WHEREAS, long-term, low-interest rate loans usually are not obtainable through any source other than government and such loans are urgently needed, therefore be it

RESOLVED, that the American Public Health Association endorse the principle of long-term federal loans to those nonprofit, prepaid, group practice plans meeting sound professional standards, such standards to be defined and administered by the Public Health Service in cooperation with state and local health agencies.

Financing Health Services for the Aged

(The following resolution is to be considered as an addendum to the resolution on "Financing Health Services for the Aged" Adopted in 1958 [A.J.P.H. 49:125 (Jan.), 1959]. It is to be inserted between the first and second "Resolved" in the original resolution.)

RESOLVED, that the American Public Health Association recommend that medical care programs financed by a system of government insurance that may be developed be accompanied by provisions to protect and encourage high-quality care, including the placement of responsibility for administration of services under the individual states, preferably the state health departments.

Lung Cancer and Cigarette Smoking

WHEREAS, lung cancer is a rapidly increasing fatal disease which now kills more than 25,000 people in the United States each year and if present trends continue will claim the lives of more than 1,000,000 present school children in this country before they reach the age of 70 years, and

WHEREAS, scientific evidence has established that excessive cigarette smoking is a major factor in the disease, and

WHEREAS, public health officials of the United States and many other countries have pointed out the relationship between cigarette smoking and lung cancer, therefore be it

RESOLVED, that the American Public Health Association call upon health authorities to undertake a broad educational effort, especially among young people, to prevent cigarette smoking, and be it further

RESOLVED, that the American Public Health Association urge health authorities to collaborate with voluntary health organizations and with educational authorities in this effort.

Qualifications for State Health Officers

WHEREAS, the development and administration of adequate public health services in each state demand the leadership of a properly qualified person trained in medicine and in the specialty of public health, therefore be it

RESOLVED, that the American Public Health Association recommends that state health officers be doctors of medicine skilled in public health and experienced in public administration.

Medical and Public Health Exhibit at the 1964 World's Fair

WHEREAS, it is proposed to hold a World's Fair in the United States in 1964, and

WHEREAS, it has been demonstrated that such fairs held in the past have provided unequaled opportunity for the health education of the public, and

WHEREAS, the advancement of the public health is dependent in a large measure on a public knowledge and understanding of public health and personal hygiene, and

WHEREAS, a high standard of public health is essential for the maintenance of democracy, therefore be it

RESOLVED, that the American Public Health Association endorses the proposals for a World's Fair to be held in the United States in 1964, and earnestly recommends that planned provision be made in that fair for a coordinated exhibit on medicine and public health, not less in size and scope than the medical and public health exhibit which was a major attraction of the New York World's Fair of 1939-1940; and that the Executive Board of the Association be instructed to appoint a committee through which the Association will offer its experienced assistance to the new World's Fair organization; and that the Association calls on its 13,000 members, representing more

than a dozen public health specialties, to stand ready to give freely of their professional counsel in the development of a public health exhibit for the proposed World's Fair which will demonstrate the great advances of public health and interpret those advances to the public in a dramatic fashion for their greater physical and spiritual well-being.

Support of Cooperative International Activities for Health Education of the Public

WHEREAS, the need for the coordination of efforts by individuals and of voluntary groups is essential to the improvement of the health education of the public here and abroad, and

WHEREAS, one of the difficulties in effecting cooperative activity among voluntary groups in this country with those abroad has been the lack of a suitable organizational mechanism, and

WHEREAS, the American Public Health Association has given support to movements designed to bring about better cooperation among health workers and groups, therefore be it

RESOLVED, that the American Public Health Association commend the American National Council for Health Education of the Public, Inc., commonly known as ANCHEP, for its leadership in providing a bridge between nongovernmental, voluntary, and professional groups in the United States of America and the voluntary groups in other nations in matters of health education of the public.

In Memoriam

WHEREAS, since the Eighty-Sixth Annual Meeting of the American Public Health Association there has been recorded the irreparable loss of 87 Fellows and members, all of whom have been cherished participants in this professional society, many having made outstanding contributions to the success of the Association, therefore be it

RESOLVED, that the Association express its deep regret at this loss, and be it further

RESOLVED, that the attached list of those deceased constitute a part of this resolution.

Deceased Members and Fellows—November, 1958, to September, 1959

Name	Member	Fellow	
Lorenz S. Baur, Ph.D., Columbus, Ohio	1950		
William R. Berry, Norfolk, Va.	1928	1933	
Leo Berman, M.D., Chestnut Hill, Mass.	1956		
Elizabeth E. Bishop, M.D., M.P.H., Hardin, Mont.	1958		
J. H. Black, M.D., Dallas, Tex.	1919	1932	
Jacob M. Block, Newark, N. J.	1953		
Richard A. Bolt, M.D., Dr.P.H., Berkeley, Calif.	1919	1923	Charter
Ernest A. Branch, D.D.S., Raleigh, N. C.	1946	1956	
Jerome W. Brower, M.A., St. Paul, Minn.	1947	1957	
Edward B. Bukowski, M.D., Buffalo, N. Y.	1939		
Selwyn D. Collins, Ph.D., Washington, D. C.	1924	1930	
Isee L. Connell, M.D., Jacksonville, Fla.	1946		
Robert S. Cowles, M.D., Greenville, Tenn.	1951		
James P. Cozzens, M.D., Cleveland, Ohio	1957		
Elizabeth M. Dach, New York, N. Y.	1957		
Ellis K. Devitt, M.D., Old Lyme, Conn.	1933		
Harry K. Dillard, M.D., Lexington, Ky.	1953		
Henry G. Dunham, Delray Beach, Fla.	1921	1931	
V. M. Ehlers, C.E., Austin, Tex.	1919	1929	
Amelia M. Engel, Palisades Park, N. J.	1948		
J. H. Epperson, Durham, N. C.	1923	1931	
Linwood Farley, M.D., Williamsburg, Va.	1935		
Charles Turner Foulk, II, Englewood, N. J.	1941		
John H. Fountain, M.D., M.P.H., Seattle, Wash.	1939	1948	
Elizabeth G. Fox, R.N., Bethany, Conn.	1920	1922	Charter
William M. Frazer, M.D., Cheshire, England	Honorary Fellow	1942	
Channing Frothingham, M.D., Chestnut Hill, Mass.	1949		
R. B. H. Gradwohl, M.D., St. Louis, Mo.	1919	1946	
Howard W. Green, Cleveland, Ohio	1916	1927	

Name	Member	Fellow
Alice Griffith, San Francisco, Calif.	1920	
John F. Hackler, M.D., M.P.H., Muskogee, Okla.	1937	1941
Arthur B. Haw, M.S., Ottumwa, Iowa	1923	
Theodore Horton, Sandwich, Mass.	1912	1922 Charter
William L. Hutton, M.D., Brantford, Ontario, Canada	1919	
Portia G. Irick, R.N., Santa Fe, N. M.	1935	1947
Edward E. Johnson, M.D., D.P.H., San Francisco, Calif.	1918	
Herbert G. Johnstone, Ph.D., San Francisco, Calif.	1934	
Frances A. Kenyon, M.D., Woodville, R. I.	1936	
Henrietta S. Kice, Garden City, N. Y.	1952	
Herbert R. Kobes, M.D., M.P.H., Springfield, Ill.	1941	1948
Frederic M. Kriete, M.D., Berkeley, Calif.	1944	1949
Paul C. Laux, Columbus, Ohio	1951	
Fred J. Lewis, C.E., Nashville, Tenn.	1939	
James D. Manny, D.D.S., M.P.H., Jersey City, N. J.	1958	
Helen Martin, Cincinnati, Ohio	1944	
Daniel F. McCarthy, Richland, Wash.	1953	1956
Philip H. McCaul, D.M.D., M.P.H., Framingham, Mass.	1948	
Denis McGenty, M.A., New York, N. Y.	1958	
Christopher L. Mengis, M.D., Opelousas, La.	1938	1950
Patterson M. Menlowe, M.D., McKeesport, Pa.	1941	
Charles G. Merrell, Bryn Athyn, Pa.	1931	1934
Donald H. Miller, D.D.S., Elmira, N. Y.	1946	
Merl P. Moon, Ph.D., Des Moines, Iowa	1919	1933
Ray C. Mork, Birmingham, Ala.	1949	1957
Whitelaw Reid Morrison, M.D., Oberlin, Ohio	1945	1948
Paul D. Mossman, M.D., Seattle, Wash.	1925	
Teresa R. Murphy, Mount Pleasant, Mich.	1955	
Ralph W. Nauss, M.D., Dr.P.H., Gainesville, Fla.	1917	1923
Elmer M. Nelson, Ph.D., Washington, D. C.	1929	
Dorothy Novotny, Greenwich, Conn.	1943	
William Wesley Peter, M.D., Dr.P.H., Port Republic, Md.	1918	1923
Dr. Gustavo Pittaluga, Havana, Cuba	Honorary Fellow	1935
Everett W. Probst, M.D., Rockaway, N. J.	1944	1947
Cornelius P. Rhoads, M.D., D.Sc., New York, N. Y.	1956	
Emilie G. Robson, R.N., Boston, Mass.	1925	1938
Lois Rosenbaum, M.D., New York, N. Y.	1952	
Thomas T. Ross, M.D., M.P.H., Arkadelphia, Ark.	1937	
Raymond E. Seth, M.D., Seattle, Wash.	1953	
Alfred E. Shipley, M.D., D.P.H., Brooklyn, N. Y.	1915	1922 Charter
Edgar G. Smeltzer, Jr., San Antonio, Tex.	1946	1951
Jacob Smith, M.D., New York, N. Y.	1953	
Daniel Stats, M.D., New York, N. Y.	1956	
C. Roy Steingrube, M.D., Cincinnati, Ohio	1958	
Raymond VanBuren Stone, D.V.M., Alhambra, Calif.	1927	1931
George K. Strode, M.D., Whitingham, Vt.	1919	1923
Michael J. Takos, M.D., M.P.H., Miami Springs, Fla.	1957	
Albert R. Taylor, M.D., M.P.H., Cheyenne, Wyo.	1949	
Anna B. Towse, Fulton, N. Y.	1926	1939
Edward C. Trax, McKeesport, Pa.	1919	
Felix Joel Underwood, M.D., Jackson, Miss.	1924	1934
Colonel Lester P. Veigel, San Francisco, Calif.	1953	
Harry W. von Loesecke, Silver Spring, Md.	1929	1933
Theda L. Waterman, Milwaukee, Wis.	1941	1947
Robert C. Wheeler, Albany, N. Y.	1924	
Harry F. Wilson, M.D., M.P.H., Columbia, S.C.,	1935	
Harold B. Wood, M.D., Dr.P.H., Harrisburg, Pa.	1909	1922 Charter
Cramond C. Wright, M.B., D.P.H., Dauphin, Manitoba, Canada	1954	

Resolutions not referred to the Governing Council for approval are accounted for as follows:

Several resolutions were received subsequent to the deadline date for submission. One was on the role of state and local agencies in air pollution control, another urged salary increments for sanitary engineers who are diplomates of the American Academy of Sanitary Engineers, and the third dealt with the content of school textbooks. Other resolutions received too late for action were covered by 1959 resolutions recommended for adoption. One of these called for continued federal support of water pollution control grants, and two, essentially similar, would have required manufacturers to compile information for poison control centers.

A resolution on planned parenthood was held in abeyance, since a comprehensive statement on population control, subsequently adopted by the Governing Council, was being prepared by the Executive Board.

A proposal on increased educational opportunities for the preparation of social workers was deemed inappropriate, in the belief that the APHA should rather support the action of the social workers' professional organization and not initiate action itself. Three others were considered unnecessary in view of general provisions and programs which exist: one called for equalization of salaries; one dealt with extension of traineeship grants for nurse training (on which federal legislation had recently been enacted); and one with support for research in public health nursing. A resolution placing the Association in opposition to the testing of nuclear weapons seemed an unsuitable subject for action by a professional public health organization. (See, however, another resolution adopted on radiation hazards.)

Since the APHA had already adopted pertinent resolutions and policy statements on chronic disease programs, it seemed wiser to refer three proposals on the subject to the Technical Development Board, asking it to develop a comprehensive statement or resolution. One called for dental care, another for rehabilitation programs, and the other, received too late, for suggested programs of health education, all for the chronically ill.

Resolutions of previous years covered five proposals received on: federal support of dental programs; federal grants for construction of municipal sewage treatment facilities; assistance to universities for training in environmental health; health education instruction for all public health students; and federal grants in aid to states for training.

One resolution, voted down, recommended the Social Security method of financing health care for the aged; this had been proposed as an addendum to the 1958 resolution on this subject. (For the addendum adopted, see resolutions above.) Two sections withdrew resolutions, one on dental care for children and the other on health science teaching. The proposed commendation of the Metropolitan Life Insurance Company upon the 50th anniversay of the founding of its health and welfare program and endorsement of the proposed International Health Year were left to presidential comment.

POLICY STATEMENTS

The following policy statements were adopted by the Governing Council, American Public Health Association, at its Eighty-Seventh Annual Meeting in Atlantic City, N. J., October 21, 1959.

Public Health Role in Medical Care*

The official public health department is the principal agency charged legally with the protection of the health of the community as a whole. It should (1) exercise leadership and set patterns which will insure high quality of care in all endeavors concerned with the maintenance and promotion of health, the prevention and treatment of disease and disability and rehabilitation for all segments of the population; and (2) provide medical care for those groups of individuals for whom it is given specific responsibility, either by legislative action or through agreement with other bodies. The extent of public health department participation in medical care will vary from community to community, but it must be recognized that the demand for the provision of such care by the official health agency is increasing.

Traditionally, public health agencies have sought to fulfill such obligations by clarifying the nature and magnitude of health problems, by bringing the resources of the community to bear on such problems, by maintaining standards through regulations, by demonstration, education and evaluation, and in some states by providing actual medical care when it is not otherwise available to the individual.

Many categorical approaches have been developed and administration divided among a multiplicity of groups, organizations, and agencies. The provision of modern comprehensive medical care is complex and costly. Continuity of care in the home, in the hospital, or in other institutions is necessary. Inadequacy in any one of the areas of service may work to the detriment of another and may lead to unnecessary or inappropriate utilization of facilities and inefficient use of funds.

Departments of health can and should make available to members of the health professions and to others providing medical services technical advice and assistance as well as specialized personnel, such as public health nurses, nutritionists, and physical therapists. The department should also make available to individuals and consumer groups advice and help in evaluating medical care and developing health service programs.

A number of diseases, such as cancer, heart disease, mental illnesses, diabetes, and dental caries are increasing in public health prominence. In cooperation with other groups and with the advice and assistance of the health professions, health departments should participate in the provision of such medical care services as are necessary to improve the control of these diseases.

Public health agencies through specialized disciplines, such as epidemiology and biostatistics, are developing new concepts and methods in research, planning, and evaluation of medical care developments. The promotion of high-quality care for all members of the community should be a particular concern of the health department. This may be accomplished by establishing high standards for those programs for which it is directly responsible and by working with other agencies in the community, such as professional societies, organized

* The term "medical care" as used in this statement refers to all types of personal health services and care of the sick or disabled by physicians, nurses, dentists, and other health professions, whether provided through hospitals, clinics, or other community programs administered by public or private agencies or through the medium of private practice.

medical care groups, hospitals, and related institutions to develop means of appraising the quality of care and assessing the impact of various programs and methods of financing on the health of the community.

The health department has inescapable responsibility for promoting the maximum application of prevention in all medical care activities. In prevention lies a potential major area of progress in solving increasingly difficult problems of medical care.

Local and state governments, with and without federal assistance, are assuming greater responsibility for providing medical care which would otherwise be unavailable or for which persons or families are unable to pay. Because of medically and other specially trained personnel on their staffs the health departments are the logical and appropriate agencies of government for planning, developing, and administering programs of medical care. In some states such responsibilities are not possible of achievement at the present time because of constitutional or legal provisions. Under such circumstances, joint programs can be arranged by contractual agreements. The decision as to whether or not a health department will be given responsibility for the administration of such programs should be left to the discretion of each state or local government. Under any circumstances the health department should participate in an over-all plan for a coordinated program. This would help correct duplication, overlapping, and gaps in the continuity of the program regardless of which agency has the major responsibility. Any federally sponsored and supported programs should clearly give to the states (governors or legislatures) the right to designate the responsible state agency and to this end federal laws should be amended and federal regulations revised. While in some states there might be legal barriers to designating state health departments, when this is not so the state health agency should be given primary consideration for this health responsibility.

In summary, public health departments have an obligation and an unusual opportunity in the field of medical care. This is especially true in the prevention of disease and disability. Whether or not the public health agency participates in or actually administers medical care services, it should exert leadership in setting standards, in promoting quality and efficient use of resources through health education, demonstration, and research.

The Population Problem

There is today an increase of population which threatens the health and well-being of many millions of people. In many areas of the world substantial population increase means malnutrition and outright starvation. In other areas it may mean increased stress in family life, reduction of educational opportunity, and the retardation of the industrial development on which a nation's rising standard of living depends. No problem—whether it be housing, education, food supply, recreation, communication, medical care—can be effectively solved today if tomorrow's population increases out of proportion to the resources available to meet those problems.

The patterns of family life directly affect human health and individual capacities. Serious public health problems are posed when family size impairs ability to substain a healthful way of life, when childbearing may affect adversely the health of the mother and her offspring, when the cultural and spiritual aspirations of the family are frustrated by sterility.

The interplay of the biological, ecologic, cultural, and economic factors that operate to produce population change is not adequately understood.

Especially lacking is scientific knowledge concerning human fertility. However, the healthful effects of family planning and spacing of births has been recognized by leaders of all major religious groups, as well as by leaders in medicine, welfare, and public affairs. Several methods are now available for the regulation of conception, one or another of which may be selected as medically appropriate, as economically feasible, or as consistent with the creed and mores of the family concerned.

The public health profession has long taken leadership in defeating disease, disability, and death. It must now assume equal leadership in understanding public health implications of population imbalance and in taking appropriate action.

The American Public Health Association, retaining cognizance of the principle of religious freedom by all religious groups as expressed, for example, in the First Amendment of the Constitution of the United States, believes therefore that:

1. Public health organizations at all levels of government should give increased attention to the impact of population change on health.

2. Scientific research should be greatly expanded on (a) all aspects of human fertility; and (b) the interplay of biological, psychological, and socioeconomic factors influencing population change.

3. Public and private programs concerned with population growth and family size should be integral parts of the health program and should include medical advice and services which are acceptable to the individuals concerned.

4. Full freedom should be extended to all population groups for the selection and use of such methods for the regulation of family size as are consistent with the creed and mores of the individuals concerned.

* * *

Scientific Exhibits Earn Citations—Atlantic City Annual Meeting

Eleven scientific exhibits displayed certificates of merit at the 87th Annual Meeting in Atlantic City. The evaluation was conducted by the Committee on Scientific Exhibits, Sol Lifson, chairman, and a group of observers, principally members of the Public Health Education Section and graduate students at Yale University.

The cited exhibits were sponsored by:

Canadian Department of National Health and Welfare

Children's Bureau

Council on Foods and Nutrition of the American Medical Association

Epidemic Intelligence Service of the Communicable Disease Center

Erie County, N. Y., Department of Health

International Cooperation Administration

Milwaukee Health Department

National Heart Institute and the American Heart Association

Accident Prevention Program of the U. S. Public Health Service

Tuberculosis Program of the U. S. Public Health Service

The table top exhibit presented by the Brookline, Mass., Department of Health also won a citation.

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA Affiliated Societies and Branches

SOCIETY AND SECRETARY

ALABAMA PUBLIC HEALTH ASSOCIATION, Ralph Roberts, State Health Dept., Montgomery
ARIZONA PUBLIC HEALTH ASSOCIATION, J. Rex James, Maricopa County Health Dept., Phoenix
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Vada Russell, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN, PUBLIC HEALTH ASSOCIATION, Mrs. Joan Davis, City Health Dept., San Jose
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Dorothea Hansen, City Health Dept., Los Angeles 12
COLORADO PUBLIC HEALTH ASSOCIATION, Alice de Bruyn Kops, 4660 S. Delaware, Englewood
CONNECTICUT PUBLIC HEALTH ASSOCIATION, Shirley Thayer, R.N., 61 Arnold Way, West Hartford 7
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, Calle 19 No. 511 Altos Vedado, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Everett H. Williams, Jr., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Carl Fox, 33 Pryor St., N.E., Atlanta
HAWAII PUBLIC HEALTH ASSOCIATION, Alison MacBride, R.N., 510 S. Beretania St., Honolulu 13
IDAHO PUBLIC HEALTH ASSOCIATION, Charles Hammond, P. O. Box 640, Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Gale E. Coons, State Board of Health, Indianapolis
IOWA PUBLIC HEALTH ASSOCIATION, Lloyd Coe, Iowa Hospital Association, 1012 Liberty Bldg., Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, W. W. Wilmore, Kansas Tuberculosis and Health Assn., 1134 Topeka Ave., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Peggy Fisher, 620 S. Third St., Louisville 2
LOUISIANA PUBLIC HEALTH ASSOCIATION, Lucille Godelfer, State Dept. of Health, New Orleans 7
MARYLAND PUBLIC HEALTH ASSOCIATION, Mary Thompson, Prince Georges County Board of Education, Upper Marlboro
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Marjorie Delevan, 1817 West St. Joseph Street, Lansing
MINNESOTA PUBLIC HEALTH CONFERENCE, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, H. E. Boone, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Thomas S. Willett, Montana Public Health District 1, Hardin
NEBRASKA PUBLIC HEALTH ASSOCIATION, George R. Underwood, M.D., 935 R. St., Lincoln, Neb.
NEW JERSEY PUBLIC HEALTH ASSOCIATION, Waldo McNutt, M.P.H., Delaware River Drive, Frenchtown
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Daniel T. Marley, P. O. Box 8066, Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Frances Ann McVey, 4317 Robinson St., Flushing 55, N. Y.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mrs. Kathleen Boland, Rensselaer County Health Dept., Troy
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, Robert W. Brown, Box 7525, Asheville
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice H. Peterson, M.D., State Dept. of Health, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Mrs. June O'Donnell, 3516 Braddock St., Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Marjorie Butler, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Russell E. Lee, P. O. Box 231, Portland 7
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Mae de Acin, Apartado 211, San Juan 2
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Mrs. Laura M. DeMarse, State Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Katherine Brandon, M.D., P. O. Box 25, Foothill Station, Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Helen W. Wiesmann, 1220 E. Broad St., Richmond
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Tom Drummey, State Dept. of Health, Smith Tower, Seattle
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Katherine L. Brown, West Virginia State Dept. of Health, Charleston 5
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, 1 W. Wilson St., Madison
MIDDLE STATES BRANCH, APHA, Thelma Luther, Dept. of Health, Des Moines, Iowa
SOUTHERN BRANCH, APHA, Guy Tate, Jr., Jefferson County Health Dept., Birmingham, Ala.
WESTERN BRANCH, APHA, Robert G. Beaumier, 1309 Smith Tower, Seattle, Wash.

Newest Affiliate—84 Years Young

The New Jersey Public Health Association was born on October 2 out of a joint meeting of the New Jersey Health and Sanitary Association and the New Jersey Council for Local Public Health Services. The former, with a history of 84 years, had earlier voted to invite the latter, organized in 1951, to form a merger which would then apply for affiliation to the American Public Health Association.

At the all-day meeting Mrs. Asher Yaguda, chairman of the New Jersey Commission to Study the Administration of Public Medical Care, reviewed the findings of the recently published commission's report to the governor. Among the recommendations of this commission were the establishment of a Medical Care Unit in the Division of Welfare of the state's Department of Institutions and Agencies; that the medical care of all assistance recipients and medically needy be administered by County Boards of

Welfare; that nursing home care units be improved and expanded in order to keep in the community all those persons who can be provided for without institutional care. The Board of Control of the Department of Institutions is asked to define medical indigency, which definition shall become part of the administrative rules. Payment for hospital care of assistance recipients and the medically indigent should be paid for on a per unit basis with the abandonment of the present complex system of appropriations and expenditures.

Roscoe P. Kandle, M.D., state commissioner of health, spoke on a voluntary public health association in New Jersey. He defined public health in New Jersey as a "systemless system, characterized by real ingenuity, by improvisation, by concentration on getting a particular job done rather than on stereotypes of administrative pattern." He promised that the local community could write its own ticket as to its particular administrative pattern for providing at least the minimum standards now accepted for public health performance in the state. Dr. Kandle's address will be published in a forthcoming issue of New Jersey's Health Bulletin.

Francis B. Elder, engineering associate of the APHA, illustrated by specific examples some of the roles that might be filled by an affiliated public health association. Among his examples were the North Carolina study and recommendations for salaries and personnel structure; the credit union for Louisiana state health employees, as well as a development of the history of that affiliate, constituting, in effect, the history of public health in the state; the New Mexico student loan fund; the Oklahoma Legislative Committee; the evaluation and analysis of public health administration in Utah; health careers projects, for example, in Connecticut and New Jersey; the study of personnel administration by the Massachusetts Committee on Professional Standards and Government in cooperation with the League of Women Voters and other agencies.

At the business session it was reported that 49 new members had been accepted since the May meeting of the New Jersey Health and Sanitary Association and some 40 others were voted into membership at the October 2nd meeting. A balance in the treasury of $1,064 was reported. A constitution for the newly merged organization was voted. Among its provisions were that all officers, except secretary and treasurer, are to be elected for a one-year term with limitation to two consecutive terms. Secretary and treasurer are elected for a two-year term. The representative to the Governing Council, American Public Health Association, is to be selected by the executive committee.

A resolution was passed to the effect that in view of the "Proposed Recognized Public Health Activities and Minimum Standards of Performance for Local Health Departments," suggested by a joint advisory committee consisting of 26 local health officers of the state, the Public Health Council of New Jersey be urged to prescribe the standards of performance and put them in practice as soon as possible and, further, that representatives of NJPHA be urged to attend the public hearing on these standards in Trenton on October 8. A report of the Careers Committee indicated that money to carry on the work of the committee would be available from New Jersey pharmaceutical concerns if tax exemption can be obtained for the donors.

An honorary membership was presented to the outgoing secretary, John Hall, public health engineer, State Department of Health, for his long and devoted service both to the New Jersey Health and Sanitary Association and to public health in the state.

The first elected officers of the New Jersey Public Health Association are as follows:

President—John J. Hanson, health officer, New Brunswick Health Department
President-Elect—Francis Elder, engineering associate, American Public Health Association
First Vice-President—Mrs. Thomas F. Delaney, executive director, Essex County Service for the Chronically Ill
Second Vice-President—Mrs. Arne Bernard, Vineland
Secretary—Waldo R. McNutt, M.P.H., executive assistant, State Department of Health
Treasurer—Edward Gerner, South Orange health officer.

The New Jersey Public Health Association was elected the 46th Affiliated Society of the APHA at the 87th Annual Meeting in Atlantic City, October 19-23.

Nebraska Stresses Lay Viewpoint

Nebraska Public Health Association's 9th annual meeting (September 23-24, Lincoln) got off to a morning start with six sections meeting separately. Health education concentrated on the state's traffic problems; public health nursing—family counseling; health officers—administration of public health; laboratory—antibiotics in milk; sanitation—radiation surveillance; social service—social work in an Indian Area health office.

Following the first general session, Philip Vogt, director, Douglas County Welfare Department (Omaha) presented the keynote address "Public Health from the Layman's Point of View." The theme also found its place at the second general session in a panel discussion on fluoridation as a community issue. The third general session audience heard Thaddeus P. Krush, M.D., director, Nebraska Psychiatric Institute, give a progress report on mental health in Nebraska.

At the banquet, NPHA presented Leonard O. Vose, director, Laboratory Division, Nebraska State Health Department, with its Individual Award for 1959. The Group Award went to the American Red Cross.

During the conference a special study committee presented its recommendations on the purposes of the NPHA, on the interrelationships and functions of its sections, and on the improvement of "between-meetings" communications.

NPHA is organizing a "student section." Eight students of high school or undergraduate level accepted the association's invitation to attend a special panel on "health careers," during which a short film on the subject was shown.

Resolutions on rehabilitation, traffic accidents, and fluoridation were among those presented by the Committee on Resolutions and Legislation. The chairman, Victor E. Levine, M.D., Ph.D., professor of biological chemistry and nutrition, Creighton University School of Medicine, reviewed many of the "health bills" passed in the last session of the state legislature.

NPHA reports 256 paid-up members for 1959, including 67 new members. Officers for 1959-1960 are:

President—Violet DuBois, director, Division of Public Health Education, Omaha-Douglas County Health Department
President-Elect—E. A. Rogers, M.D., M.P.H., director, Nebraska State Health Department
Vice-President—Mrs. Frank Dowd, 4811 California St., Omaha
Secretary—George R. Underwood, M.D., 935 R St., Lincoln
Treasurer—Donald E. Olson, M.P.H., associate director, Omaha-Douglas County Health Department.

Institutional Care in South Dakota

Approximately 100 speakers took part in the 1959 Welfare, Health, and Rehabilitation Conference in Sioux Falls, S. D., September 30-October 2. The meetings were sponsored by South Dakota's Public Health Association, Social Welfare Conference, and Chapter, National Rehabilitation Association.

The conference theme was institutional care of persons in six categories: the tuberculosis patient, the senile aged, the mentally ill, child offenders, adult offenders, and the mentally retarded. "Section meetings" devoted to these subjects con-

tinued throughout the three-day conference.

The opening general session was a two-hour meeting on "the organization of the joint conference." The other general sessions, also held the first day, considered "South Dakota Institutions Supervised by Board of Charities and Corrections." The panel consisted of representatives of the state hospital system, the clergy, a soldier's home, a boys' and girls' training school, and a penitentiary.

The South Dakota Chapter of the National Association of Social Workers held a pre-conference meeting on September 29 jointly with the Sioux City, Iowa, NASW Chapter. Officers of the WHR Conference elected were:

President—Wesley Duiker, State Department of Health, Pierre
President-Elect—Cecelia Schuck, Ph.D., State College, Brookings
Vice-President—Robert Beckwith, Chamberlain
Secretary-Treasurer—Alice Brady, State Department of Health, Pierre.

Minnesota Tries New Procedure

The 554 registrants at the 13th annual Minnesota Public Health Conference, Minneapolis, September 24-25, found a new registration procedure awaiting them. A fee of two dollars was required of all, to be applied to the coming year's dues in the case of members, and to provide paid-up membership for any nonmember who wished to apply and join the conference. The report is that this system worked very well for the obvious purposes intended.

Newly recognized virus diseases and their effect on public health, implications for school health in the Austin, Minn., survey, today's problems and progress in tuberculosis control, and the impact of modern food merchandising on public health were among the major subjects of the sessions.

On the second day of the conference, five "breakfast table discussions" (limited to 35 persons apiece) centered on poison control service, radiation in the environment, communicable disease control in hospitals, nursing and the community, and rabies control problems.

Clergymen spoke at the two luncheon sessions, one on "There's a human side to rehabilitation," and one on providing facilities for the care of the chronically ill and aged.

Hubert H. Humphrey, Minnesota's senior senator, delivered the fourth annual Albert W. Chesley, M.D., Memorial Lecture in Public Health at the memorial banquet, addressing the topic "International Peace Through International Medical Research."

At its business meeting the conference adopted a new constitution and by-laws, and presented honorary membership plaques to Ralph L. West, D.V.M., executive officer, State Livestock Sanitary Board, and Jay Arthur Myers, M.D., professor emeritus, University of Minnesota School of Public Health. Robert D. Ragsdale, executive secretary, Hennepin County Tuberculosis Association, was outgoing president. New officers are:

President—A. B. Rosenfield, M.D., M.P.H., director, Division of Special Services, Minnesota Department of Health
First Vice-President—Robert K. Anderson, D.V.M., M.P.H., professor of veterinary bacteriology and public health, University of Minnesota
Second Vice-President—Mrs. Nelson W. Taylor, chairman, Washington County Public Health Nursing Board
Treasurer—Stewart C. Thomson, M.D., M.P.H., professor and associate director, University of Minnesota School of Public Health.

APHA membership application blank on page XXV

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication. **All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.**

POSITIONS AVAILABLE

Public Health Medical Officer—San Luis Obispo County, Calif., population 78,000. Salary $800-$957, open to negotiation based on qualifications. Early opportunity for advancement to county health officer if qualified. California medical license and equivalent to one year experience in public health maternal and child health program. Apply Civil Service Commission, 967 Osos St., San Luis Obispo, Calif.

Medical Health Officer—for established rural county health department in central Illinois. Good personnel policies with vacation and retirement. Salary range $9,600-$12,000 for physician with public health training and experience. Contact W. T. Douglas, M.D., Hillsboro, Ill.

Local Health Director—Charlotte and Mecklenburg County, N. C. Population 275,000; million-dollar budget; staff of 150; outstanding new headquarters ready for occupancy. Board certification required. Salary range $12,600-$16,380, with allowance for experience, plus travel. Reply to Dr. Howard P. Steiger, 207 Hawthorne Lane, Charlotte 4, N. C.

Pediatrician—for state health department. To act as pediatric consultant within the agency and work with professional and lay groups in the field. Included in work: hospital standards, school health problems, statistical studies, future program planning. Starting salary $10,320. Ohio medical license, one year internship, at least two years' graduate training required; preferably Board of Pediatrics or eligible. Civil service position; vacation and sick leave, annual salary increments, retirement plan. Staff appointment to state university if eligible. Address inquiries to Division of Child Hygiene, Ohio Department of Health, Columbus 15, Ohio.

Health Officer—Yamhill County, 38 miles from Portland near coast and mountains. Salary $14,000 to start. Must have M.P.H. degree and some public health experience, be eligible for license to practice medicine in Oregon. Under merit system and Social Security coverage. Write to Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

Assistant Public Health Director—for Arlington County, Va. Entrance salary $10,500 a year. United States citizenship and eligibility for a license to practice medicine in Virginia required. Training or experience in public health administration desirable. Age to 50. Apply Arlington County Personnel Department, Court House, Arlington, Va.

Deputy Health Officer—for population of 640,000, with teaching responsibility in medical college. Combined beginning salary $11,900. Applicant must be under 45, have an M.P.H., at least two years' experience in public health administration, and be eligible for license to practice medicine in Alabama. Apply to Health Officer, Jefferson County Board of Health, P. O. Box 2591, Birmingham 2, Ala.

Public Health Officer—County of Imperial, Calif. The officer will supervise countywide health services for a population of 70,000. The county's 5,184 square miles includes the famous Imperial Valley. Position offers professional growth and opportunity in health services, particularly in fields of environmental sanitation, disease control, and child health. Appointment will be made within salary range of $11,280-$14,040 per year. Starting salary based on experience and qualifications. M.D. degree and license to practice in California are required, plus at least two years' full-time responsible experience in public health work. Write Administrative Assistant, Court House, El Centro, Calif., giving summary of qualifications.

CLINICAL RESEARCH

Prominent Eastern pharmaceutical company desires young MD — preferably board eligible in Internal Medicine or Psychiatry — capable of establishing and monitoring programs in therapeutic research. This position represents a unique opportunity for creativity and personal growth within the specialty. Additionally, it provides ample opportunities for travel to important conferences and academic centers and for association with outstanding authorities.

Ideal suburban living and working conditions, excellent salary and benefits. Our staff is aware of this advertisement.

Send curriculum vitae to

Box PH-96

Employment Service APHA
1790 Broadway, New York 19, N. Y.

Public Health Physician (Chief, Division of Chronic Diseases)—To direct an expanding chronic disease program in a state health department. Monthly salary range $1,100-$1,320. Required physician with specialized training and experience, and eligibility for Ohio license. Write Director, Ohio Department of Health, Columbus 15, Ohio.

Tuberculosis Control Program Director—in Anchorage office of Alaska Division of Health. Starting salary $15,000. Administrative responsibilities in directing Alaska program in cooperation with Alaska Native Health Service. M.P.H. or postgraduate experience in tuberculosis, plus four years' administrative experience. Write Douglas I. Terry, Administrative Director, Division of Health, Department of Health and Welfare, Alaska Office Bldg., Juneau, Alaska.

Medical Health Officer—with M.P.H. For established city health department, La Crosse, Wis. Salary comparable with other cities, depending on qualifications. Retirement benefits, sick leave, vacation. Write Paul Gatterdam, M.D., President, La Crosse Health Department, 1836 South Ave., La Crosse, Wis.

Director, Local Health Services—Wisconsin. Work with the state health officer and professional staff in improvement of local health services. M.P.H. degree and eligibility for license to practice medicine in Wisconsin required. Salary $1,012-$1,247, commensurate with experience. Write E. H. Jorris, M.D., Assistant State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Director, Bureau of Maternal and Child Health—Plans and directs a state-wide program for the conservation and improvement of maternal and child health; coordinates and supervises the activities of the bureau. Major activities include the child guidance, school health, and nutrition programs. Desirable qualifications and experience: M.P.H., one year of experience in private practice, five years of experience in public health work, three years of which shall have been in an administrative capacity. Pediatric training desirable. Eligibility for license to practice medicine in Wisconsin required. Salary starts at $1,122 per month, with annual merit increases of $40 to $1,297. Civil service, vacation, sick leave, Social Security, retirement benefits. Group life, hospital and sickness insurance costs shared by the state. Write E. H. Jorris, M.D., Assistant State Health Officer, 1 W. Wilson St., Madison 2, Wis.

Medical Officers, Medical Entomologists, Engineers, Sanitarians—required by the World Health Organization to serve as advisers, organizers, and field operation leaders in malaria eradication programs in all parts of the world. The following qualifications are necessary (a) Medical Officers: public health training; experience in tropical medicine and hygiene desirable, particularly in antimalarial work; (b) Medical Entomologists: field experience, particularly in antimosquito work; (c) Engineers: experience in the organizational and logistical management of large-scale operations; (d) Sanitarians: experience in antimosquito work. Apply (quoting reference MAL) to Chief, Personnel, World Health Organization, Geneva, Switzerland, giving brief details of qualifications and experience. Application forms will be sent only to those whose qualifications and experience appear to be suitable.

Public Health Nurse—Generalized public health program, Napa County, 50 miles from San Francisco. Salary range $376-$458; starting salary dependent on training and experi-

ence; liberal benefits. Automobile required; car allowance. For job description and application contact Sterling S. Cook, M.D., Director of Public Health, P. O. Box 749, Napa, Calif.

Executive Director — Combined public health nursing agency. Education and experience in public health nursing, including supervisory experience. Have well qualified health officer. Salary open. Five-day, 40-hour week, month's vacation, and liberal personnel policies. Capital city, population 216,000. Public Health Nursing Association, Des Moines, Iowa. Write Mrs. J. R. McNerney, Personnel Committee, 521 16th St., West Des Moines, Iowa.

Public Health Nurses—for generalized public health nursing in New Mexico Department of Public Health. Salaries $335-$455. Opportunities for advancement, retirement plan, and other fringe benefits. Write Merit System Supervisor, Box 939, Santa Fe, N. M.

Public Health Nurse III (District Advisory Nurse)—Give guidance and counseling to all public health nurses in a multiple-county area regarding community organization and relationships, program planning, public health nursing technics, records, and reporting. Responsible for inservice education program for local public health nurses and evaluation of nursing services. Salary range $5,664-$6,744, plus travel allowance. B.S. degree with major in public health nursing and three years' generalized experience as a public health nurse. Special requirement: registration or eligibility therefor as a registered nurse in Wisconsin; certification or eligibility for certification as a public healt' nurse in Wisconsin. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Public Health Nursing Consultant (Assistant to Director of Public Health Nursing in State Health Department)—Give consultation to public health personnel in all phases of public health nursing, including inservice education; prepare manuals, guides, etc., for public health nurses; assist in administration of program. Bachelor's degree in public health nursing minimum preparation; master's degree desirable; four years' experience in public health nursing, including two in administration or supervision. Salary: start at $6,744; maximum $8,064. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write Miss Ione M. Rowley, R.N., Director, Public Health Nursing, 119 Monona Ave., Madison 3, Wis.

Industrial Hygienists and Engineers—To assist central office unit engineers develop expanded industrial hygiene and air pollution control services on a state-wide basis. Minimum requirements: bachelor's degree in chemistry or engineering and experience in industrial hygiene or air pollution. Starting salary range for industrial hygienists $360-$600 per month, depending upon education and experience; for engineers (with Ohio license) $500-$660, depending upon experience. Civil service appointment; pension system, vacation, sick leave. State-wide travel with expenses paid. Write to H. G. Bourne, Jr., Division of Industrial Hygiene, Ohio Department of Health, Columbus 15, Ohio.

Sanitary Engineer—Fairfax County, Va. Starting salary $7,848, with increments to $9,792. Master's degree and three years' experience in sanitary engineering or five years' experience without master's degree. Liberal vacation, sick leave, retirement benefits. Merit system status. Write Director of Personnel, State Health Department, Richmond 19, Va.

Sanitary Engineers—wanted for several positions in Latin America and one in the United States. Engineering degree, minimum one year advanced study in sanitary engineering and public health leading to master in science or public health. At least five years' experience, of which two years should have been in public health. Working knowledge of English and/or Spanish. Starting salary $7,300 per annum, income tax reimbursable, plus liberal allowances. Write Personnel Officer, Pan American Health Organization, 1501 New Hampshire Ave., N.W., Washington 6, D. C.

Case Worker—To help initiate and conduct a home care program. To serve in team relationship with medical consultant and public health nurse in evaluating needs and planning for comprehensive care and rehabilitation of the chronically ill. Required to be graduate of an accredited school of social work. Liberal personnel policies, with salary dependent on experience and preparation. Contact Director, The Visiting Nurse Association of Cleveland, 3300 Chester Ave., Cleveland, Ohio.

Public Health Educator III (Dental Hygienist)—Assist in developing dental health programs for preschool and adult groups in a several county area. Coordinate dental health education activities with over-all health education program. College graduation, a year of graduate training in an accredited school of public health, and two years' experience. Licensure or eligibility for licensure to practice dental hygiene in Wisconsin essential. Start at $6,036; maximum $7,176. Civil service; vacation, sick leave, Social Security, and retirement benefits. Write R. J. Siesen, Personnel Officer, State Board of Health, 400 State Office Bldg., Madison 2, Wis.

Trained Health Educator—for well organized county health department in Michigan. Starting salary $5,200. Excellent employment benefits. Apply V. K. Volk, M.D., Dr.P.H., Health Commissioner, Saginaw County Department of Health, 1501 N. Michigan Ave., Saginaw, Mich.

Health Education Director — Develop school-community health education program; advise and assist local tuberculosis associations. Qualifications: M.P.H. degree plus two years' experience in health education. Salary open. Social Security; retirement plan. Write Kenneth C. Ross, Executive Secretary, Oregon Tuberculosis and Health Association, 605 Woodlark Bldg., Portland 5, Ore.

Public Health Educator III—Initiate and develop school-community health education programs in a multicounty district. Desirable qualifications: M.P.H. degree, plus two years' experience in health education; sound working knowledge of principles of education and methods of teaching. Salary $502-$597 per month. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write Dr. Amy L. Hunter, Director, Bureau of Maternal and Child Health, Wisconsin State Board of Health, Madison 2, Wis.

Social Work Administrator—State Board of Health, Child Guidance Division, Madison 2, Wis., Amy L. Hunter, M.D. Creative pioneering opportunity for mature, experienced social worker. Plan and integrate social work facets of public health program for prevention of emotional health problems; team approach in organization and coordination of various state-wide educational and consultation projects, including inservice training of state and local public health personnel and other professionals; education of lay groups; emphasis on discussion process to increase understanding and enhance constructive attitudes supportive of primary prevention; supervise several social workers serving on a district level in the above program. Headquarters: Madison. Requirements: M.S.W., minimum of five years' relevant experience, mainly in community child guidance clinic team, including two years as a social work supervisor. Salary $7,344-$8,724.

Biostatistician—for the Colorado State Department of Public Health. Offices in Denver, Colo. Salary $475-$620. Address inquiries to Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Microbiologist—for county health department laboratory. Requirements: California public health microbiologist license, clinical laboratory technologist license, and two years' experience. Beginning salary $451. Ideal climate, central coastal area of California. Contact R. L. Hull, M.D., Health Officer, Hollister, Calif.

Virologist — Master's degree with virus training and two years' experience. Salary $440-$550. Also, opening for a **Bacteriologist** with master's degree or one year's experience. Salary $400-$550. Entrance steps dependent on qualifications. For work under experienced virologist in diagnostic and research activities in well equipped State Virus Laboratory, State Board of Health, Helena, Mont.

Nutritionist—$455-$553. County health program. Entrance salary depends on qualifications. Master's degree in food and nutrition and two years' experience in public health nutrition work, or four years' experience in public health nutrition. Arizona Merit System, 11 N. 17th Ave., Phoenix, Ariz.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Public Health Administration — M.D., M.P.H. (Johns Hopkins, 1958); age 46. Full residency training in obstetrics followed by 14 years of obstetrical practice. Serving as a deputy commissioner (general administration) in a large county health department since June 1958. Desire position in general administration or maternal and child health. **Box PH-97,** Employment Service, APHA.

Industrial Nurse Administrator, Consultant—Female, graduate outstanding medical center, partial Ph.D. Seven years' experience in industrial nursing administration and supervision. Prefer administrative, consultant, supervisory post, with large company, New York City or environs, Florida, California, or Hawaii. Also seven years' diversified experience in hospital, nursing school administration, teaching. Would consider health education, hospital, college, school, or nursing publication post. **Box C-50,** Employment Service, APHA.

Dentist—Desires position in the public health field. University of Pittsburgh graduate. Interned in the USPHS and the Guggenheim Foundation. Seven years' military service. Affiliated with hospital dental staff while in private practice. Trained in institutional field. Will accept either clinical or administrative post. **Box D-21,** Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Medical director, important educational organization; preferably an internist, experienced in medical practice or public health work; ability to write with ease and speak in public is important; $15,000, travel expenses. (b) Medical director for private diagnostic referral clinic to be established soon; preferably FACP and Diplomate of the American Board of Internal Medicine; university city; East; $20,000. (c) Health director, university city 300,000; Southeast; staff of 150; outstanding new headquarters; $12,000-$17,000. (d) Medical director, rehabilitation center established for six years and considered one of the finest of its kind; preferably capable psychiatrist or orthopedic surgeon; up to $25,000. (e) County health officer, attractive location in Southern California, $900-$1,150. (f) Public health inspector for foreign service; master's or doctor's degree in public health, will serve an area with over 100,000 population; English is spoken.

Public Health Nurses: (a) Foreign assignment for staff nurses and teaching personnel; work with Americans; $5,000-$11,000, also Alaska. (b) Student health counselor, 250 students; well renowned medical center, Middle West, $6,000. (c) Executive nurse, organizational ability; coordinate VNA and city departments; East, to $18,000. (d) State consultant, hospital planning; prepare nursing surveys; Midcentral, to $7,500, travel expenses.

Nevada Plans for an Association

State Health Department workers and personnel from voluntary health agencies met and formed a committee at Reno in September to lay plans for a Nevada public health association. The meeting was called at the request of the Western Branch, APHA.

O. M. Seifert, D.D.S., state director of public health dentistry, is chairman of the organization committee which includes Ethelda S. Thelen, R.N., director of public health nursing; W. E. Winikow, M.D., Washoe County health officer; R. G. Bull, executive secretary, Nevada Society for Crippled Children; and G. William Richards, executive secretary, Washoe County Unit, American Cancer Society.

An item in "Nevada Health" for September says "With this group . . . at the helm, there is no doubt that the project will meet with full success." The article's title: "At Last! A Public Health Association for Nevada!"

BOOK REVIEWS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

CENTAUR: ESSAYS ON THE HISTORY OF MEDICAL IDEAS—By Félix Martí-Ibañez. New York, N. Y.: MD Publications (30 East 60th St.), 1959. 736 pp. Price, $6.00.

In 66 essays, reflections, articles, editorials, and comments culled from the last decade of his writings, the editor-in-chief of MD "Medical News Magazine" and the "International Record of Medicine" presents a panorama of his views on medical history, esthetics, philosophy, science, and the humanities. Although the pageant is somewhat arbitrarily divided into eight groups with such titles as "The Tapestry of History," "The Philosophy of Medicine," "Through the Psychological Glass," and "The Artist's World," one may visit with this Renaissance man of today at any time or place. For the brief papers written in the rich, dramatic style of the romantic historian are displayed to inform informally, not to weight the mind.

The scope of the volume, although broad is not deep, although learned not scholarly. The author exhibits the glint of varied treasure without exploring or probing. Here one finds a heartwarming, nostalgic memoir to Santiago Ramon y Cajal, one of modern Spain's great medical teachers and experimentalists, alongside snapshot histories of public health, neurology, ophthalmology, and psychobiology. He also essays a chronicle on endocrinology, tracing the evolution of our knowledge of the adrenal gland.

But Spain and psychiatry are the taproots of his thoughts and interpretations. He draws heavily on the culture of his motherland for his historical accounts—Don Quixote and medicine, the story of a Spanish sorceress, among others—and equally on his specialty, telling of symbolism, physiodynamic therapies in psychiatry and biochemical aspects of that field of medicine.

The roster includes a short story, "The Lives of Leonardo," which suggests the reason for Mona Lisa's smile—that it is the portrait of the artist himself, hiding the deep feeling that he might be master of the universe, but is held down by human limitation.

To Martí, the true physician is a man of culture, of letters, of grace. This volume, from which one may pluck a pastille at will, is his invitation to become such a man. IRVING LADIMER

FLORENCE SABIN—COLORADO WOMAN OF THE CENTURY—By Elinor Bluemel. Boulder, Colo.: University of Colorado Press, 1959. 238 pp. Price, $5.50.

Those of us who have had the good fortunate of an acquaintance with Dr. Sabin have approached the reading of her biography with some trepidation. For she combined in a unique fashion the qualities of an outstanding scientist, teacher, and crusader with the personality of an unpretentious and gracious human being, blending sharp scientific curiosity and assurance with that sincere interest in people and their well-being which characterizes the truly great.

It is, therefore, a pleasure to report that the author has done justice to her subject. Mrs. Bleumel, physician's wife and trained librarian who knew "Dr. Florence" personally, has done painstaking research over several years to get at the many facets of Dr. Sabin's rich professional and personal life (1871-1953). While the biography is factual to a high degree of precision—including a complete bibliography of Dr. Sabin's 113 publications, as well as a

list of secondary sources—it is suffused with the warmth and admiration which everyone experienced in her presence. Reliving Dr. Sabin's pioneer efforts is a reminder of the tremendous responsibility we have, to carry on the tradition which she so vigorously established.

This book which takes the reader pleasantly through some of the great episodes of American science, medicine, and public health—such as the early days of Johns Hopkins, the Rockefeller Institute and the public health movement in Colorado—is highly recommended not only to workers in these fields, but to all young people for intellectual stimulation and inspiration.

GERTRUD WEISS

PROTECTION IN DIAGNOSTIC RADIOLOGY—Edited by B. P. Sonnenblick. New Brunswick, N. J.: Rutgers University Press, 1959. 346 pp. Price, $7.50.

This 300-page book is a collection of classical reprints from 19 journals and from proceedings of meetings dealing with radiation protection. The reprints are grouped in sections and are tied together by remarks of the editor.

Most of the reprints are no longer obtainable by means of the usual post card request. The book contains the views, findings, and studies of a large group of authors from the United States, Europe, and Australia. The reprints date back as far as 1942 and may serve as a reminder that radiation protection has been discussed for many years before the appearance of the much publicized study of the National Academy of Science.

Apart from historical remarks the book deals with protection problems in office practice, with the significance of the maximum permissible dose levels, exposures of patients and radiographers during the various procedures. It also covers dental radiography, image intensification, radioisotopes, the effects of radiation on human heredity, natural sources of radiation, the philosophy of radiation protection, and control are discussed.

At the end of the book further resources, such as a list of the handbooks of the National Bureau of Standards, and a geographical listing of the certified radiological physicists is given.

If books such as this one were required reading for every owner or user of diagnostic x-ray machines and isotopes, and if its concepts were properly applied we would have to be much less concerned about the effects of diagnostic radiation.

JAN LIEBEN

HANDBOOK OF DIET THERAPY (3rd ed.)—By Dorothea Turner. Chicago, Ill.: University of Chicago Press (5750 Ellis Ave.), 1959. 222 pp. Price, $5.00.

The previous editions of this book have undoubtedly been a "must" on the reference shelf of public health nutritionists. Persons familiar with the handbook and new members of this professional group will be equally enthusiastic about the third edition. The size of the book is only slightly larger, with less than 100 additional pages.

Basically the book is similar to its predecessors, although many chapters have been completely rewritten. Emphasis is placed on presenting simple facts about diet therapy in terms of normal nutrition. Section II is entitled "Modifications of the Normal Diet" with therapeutic diets under subheadings, such as "Modifications in Consistency," "Liquid Diets," "Soft and Low-Fiber Diets." The inclusion of the latest information on such subjects as diet after 65 years of age, fat and fatty acids, and phenylketonuria indicate the thorough coverage of this excellent book for workers in the field of community nutrition.

The glossary of dietetic terms is also revised. The simple definitions of "dietitian" and "nutritionist" are less descriptive than those in the previous editions. The subdivisions into specialties are

lengthy. Interested lay people and our colleagues in health and medicine are frequently asking for a simple explanation of "nutritionist" and "dietitian." It seems unfortunate that the statements in the previous edition have been discarded rather than revised.

This book is most highly recommended and should have top priority on the list of desirable references for community agencies providing nutrition services.

MARYROSE J. BAIANO

VISION SCREENING FOR ELEMENTARY SCHOOLS: THE ORINDA STUDY—By Henrik L. Blum; Henry B. Peters; and Jerome W. Bettman. Berkeley, Calif.: University of California Press, 1959. 146 pp. Price, $3.75.

The authors report a three-year study of vision screening of elementary school children. The goal of the study was "to design the least expensive, least technical, and most effective screening program for finding essentially all elementary school children with vision problems."

The methods evaluated included Parent Questionnaire, Teacher and Nurse Observation, Massachusetts Vision Kit, the Telebinocular, California State Recommended Procedure, and the Modified Clinical Technique.

On the basis of the results of this study, the authors recommend Teacher Observation, the Modified Clinical Technique for all first-graders and all new entrants to the school system, visual acuity testing annually by the Snellen chart of all children except those scheduled for the MCT and those previously identified as having visual problems. Those failing the Snellen test should receive a Modified Clinical Technique test before referral.

The title of the report is misleading. It is extremely difficult for a person without a special knowledge of optics to visualize the content of the MCT by reading the report. It was certainly not the "least technical" of the tests used and was, in fact, a clinical examination given by an optometrist using special optical equipment. Undoubtedly, each school child should benefit from a clinical examination by an eye specialist; however, since this is not usually possible, screening methods have been developed which can be performed by lay people.

The authors recommend the use of the Snellen chart annually after the first grade. Unfortunately, they do not show the basis upon which they make this recommendation.

This study appears to have been carefully done and those involved are to be commended for the way in which optometrists and ophthalmologists have worked together in an effort to improve vision testing for children.

R. GERALD RICE

THE NATURE OF RETIREMENT—By Elon H. Moore. New York, N. Y.: Macmillan (60 Fifth Ave.), 1959. 217 pp. Price, $4.50.

This is a study made by a distinguished sociologist prior to his own retirement. It is based on answers to 900 questionnaires and an unspecified number of interviews with "retirees," as he calls those who have moved into what he designates as the "fourth stage of life." There is no indication as to how the members of the sample were distributed according to race, religion, sex, national origin, or character of previous occupation. However, one gets the impression that they were largely white persons engaged in professional or other white-collar pursuits. The book is enriched with quotations from the replies of respondents. The evidence makes it clear that no uniformity exists in the nature of retirement.

Retirement is as varied as the people who retire. Thus, the book is, in effect, a thoughtful treatise on the nature of people, especially older people, although some of his respondents had retired at age 40.

In view of the decreasing average age of retirement, it is unfortunate that this author, like so many others, does not make a clear distinction between the problems of retirement and the problems of aging. There is a notable lack of attention to the mental and physical aspects of retirement, except when tangentially touched upon as aspects of aging, and there is nothing on the special public health problems created by the increase in our "retired" population.

Despite these deficiencies from the standpoint of the professional public health worker the book is interesting reading, especially for anyone over 40. A mass of material is well presented. There is a good short annotated bibliography of references. But here, again, most references deal primarily with aging, rather than with retirement. It is unfortunate that the author did not live long enough in retirement to produce a second edition of this book, embellished from his own experience. He might then also have touched on some of the every-day problems of a retired person and how the physician, the social worker, the nurse, the health educator, and others can help the expectant "retiree" (of any age) prepare for the psychological adjustment which is especially needed by those who retire cum laude. HOMER N. CALVER

THE ECOLOGY OF HUMAN DISEASE—By Jacques M. May. New York, N. Y.: MD Publications (30 East 60th St.), 1959. 327 pp. Price, $7.50.

This book, the first of a series of three, is an interesting treatise on epidemiology, as viewed by a geographer who is also a member of the staff of a medical school. This first volume deals predominantly with the medical geography of infectious diseases as will the second; the final volume will deal with degenerative and behavioral diseases and their relationship to the geographical environment.

Philosophical material in the book has high thought-provoking qualities. The more detailed descriptions of the geographical bases for incidence of various diseases should especially interest epidemiologists and individuals concerned with disease incidence and control problems abroad. THOMAS R. HOOD

ON THE MYSTERIOUS LEAP FROM THE MIND TO THE BODY. A Workshop Study on the Theory of Conversion—Edited by Felix Deutsch. New York, N. Y.: International Universities Press (227 West 13th St.), 1959. 264 pp. Price, $5.00.

Felix Deutsch and colleagues attempt to extend our knowledge of mind-body interaction by expanding Freud's concept of conversion hysteria.

We are reminded that "mental and physical phenomena . . . are different aspects of a single process of biological adaptation, observed from different points of view and studied by different methods." Etiology of disease is not a simple cause-and-effect mechanism but involves complex, ever-changing ecological situations and their impact on the health of individuals.

The book raises at least two questions. How well have the authors succeeded in providing a theoretical model for mind-body interactions? For those concerned with preventive medicine and public health, do they provide ideas useful in dealing with our practical and theoretical problems?

The book is a presentation of the best modern psychoanalytic thinking. The retrospective review of the development of Freud's thinking on conversion is superb. Deutsch, then, carries Freud's concepts beyond hysteria in attempting to understand illness of a more organic nature. Deutsch asks, "does the conversion process lay the groundwork for subsequent organic pathology?" Adaptation to stress may take both psychological and biological pathways, reflected in changes both internal and ex-

terna! to the individual. Given certain new stress situations, the previously used psychological pathway may, given its appropriate ecological circumstances, lead to irreversible biological change. The original genetic templates, modified by biological and social learning, lay the pathway for this occurrence. One might ask Deutsch why use the word "conversion" to refer to such a complex equilibrium.

This book is primarily of use to an already psychoanalytically alerted person who can evaluate and speculate about the ideas presented. How well this kind of psychoanalytic thinking can be put to use is seen in the work of the military psychiatrists as well as of Querido, Lindemann, and Caplan in social psychiatry and public health. This book is valuable, but only as a partial contribution to a monistic, theoretical model. It gives public health few practical answers. It reminds us, however, that similar ideas have been put to use successfully in public health. More importantly, however, it suggests that well verified ideas and findings from diverse fields may yet produce in our lifetime the Einstein-like theoretical model that we in the biopsychosocial fields so urgently need. The discipline of public health, to be mature, requires an integration of psychoanalytic concepts like "conversion" into a far broader theory.

LEONARD J. DUHL

THE MUNICIPAL YEAR BOOK 1959—Edited by Orin F. Nolting and David S. Arnold. Chicago, Ill.: The International City Managers' Association (1313 East 60th St.), 1959. 606 pp. Price, $10.00.

This 26th edition of "The Municipal Year Book" follows the general pattern of previous editions and continues as a good source book of some hundred thousand facts and figures about 2,563 cities. "Public Health Developments" in 1958 is edited by Berwyn F. Mattison and annotates general trends and accomplishments during the year.

Other items of potential interest to public health workers include an introductory section on the use of statistical data and the limitations of these statistical tables. These instructions and cautions might well be paraphrased in many another volume containing numerous statistical tables.

Special note is made of brief sections on air pollution, salaries of municipal employees, and personnel practices including the listing of limits of age or residence for city employees and the results of this action. Larger sections on planning urban renewal have some significance to public health workers chiefly because they seem to reflect a strong preoccupation with physical facilities while neglecting consideration of effects on the human inhabitants.

THOMAS R. HOOD

GENETICS, RADIOBIOLOGY AND RADIOLOGY PROCEEDINGS, MID-WESTERN CONFERENCE—By Wendell G. Scott and Titus Evans. Springfield, Ill.: Thomas (301-327 East Lawrence Ave.), 1959. 149 pp. Price, $5.50.

This book represents a verbatim report of a conference held May 2, 1958, which provided geneticists, radiobiologists, and radiologists in the Midwest an opportunity to discuss current concepts of radiobiology. These concepts were considered particularly in terms of their relationship to the use of diagnostic x-rays.

The meeting was sponsored by the Subcommittee on Radiobiology of the National Academy of Sciences-National Research Council and served as a forum for the free and informal interchange of knowledge in these fields.

The discussion leaders and other participants, whose ideas are incorporated in this volume, constitute an outstanding group of workers in the radiological

health field: the basic sciences being represented by leaders in the specialties of biology, radiobiology, and genetics and in the field of application by a number of well recognized authorities in the field of radiology.

The first part of this one-day session was devoted to the summary and up dating of knowledge regarding health effects of radiation. A good explanation is given of how radiant energy disrupts normal cellular function. The mechanisms believed to underlie direct and indirect effects are brought out clearly. Considerable prominence is given the mechanism of induction of genetic mutations. The question of the existence or nonexistence of a threshold respecting dose-health effects was a point of discussion. The present-day concern about the possible nonexistence of a threshold (it is now generally agreed there is none in the case of effective genetic exposure) is touched upon, including allusions to the feeling of a number of students that there may be no threshold below which effects fail to occur. The induction of experimental tumors by single cells is cited as possible support for that theory. The difficulty of translating these findings, with certainty, to the human situation is brought out. The answer, of course, calls for intensification of research.

The second part of the discussion as presented involves, in the main, the question of safety problems in diagnostic x-ray exposure. Particular emphasis is given the need to shield the gonads during such examinations and the avoidance of unnecessary exposure of the fetus to radiation, especially during the early weeks.

Although this publication should prove of greatest value to professionals in the field of radiological health, the health worker in other fields can also profit considerably through the expanded knowledge obtained from reading this book.

FRANCIS J. WEBER

THE PRESERVATION OF EYESIGHT—By Sir Arthur Salusbury MacNaulty. Baltimore, Md.: Williams and Wilkins (428 East Preston St.), 1958. 107 pp. Price, $3.00.

This small book (about 100 pages) treats of the anatomy and physiology of the eye in rather elementary terms. Some common infections of the eye are discussed and a special chapter on the prevention of the diseases and injuries of the eye in industry is included as well. This book is intended for nonmedical readers who are interested in problems of eyesight and blindness. As such, it is useful for reference, but not as a textbook.

PERSONAL AND COMMUNITY HEALTH (11th ed.)—By C. E. Turner. St. Louis, Mo.: Mosby (3207 Washington Blvd.), 1959. 446 pp. Price, $5.50.

This book, as were preceding editions, is intended as a standard health text for the various college level groups. It presents a multitude of biological and social science facts of use to young adults in understanding basic physiological processes and the concepts of health maintenance. Differing somewhat from earlier editions, the current volume presents a salutory, although still insufficient, broadened scope in its treatment of community health concepts. For example, with its greater emphasis on general nutritional and dietary planning as opposed to the independent values of specific food groups and more adequate descriptions of both official and voluntary health agencies and programs it should be more useful to students in understanding relationships between personal and community health.

The primary focus of the volume is still, however, on personal health and hygiene and, in this sense, valuable additions and modifications have been made. One outstanding addition is the eight-plate presentation of the anatomy of the torso. Using the new technic of

illustration known as "Trans-Vision" (R), the series of transparent acetate plates present a clear and most useful overlay picture of the body's skeletal, muscular, and organic systems.

The book should continue to prove valuable as a basic text and continuing reference for college students and young adults. It would be hoped, however, that future editions might elaborate still further on the most up-to-date concepts of preventive medicine and the role of the individual in community health.

MEDICAL EDUCATION—ANNOTATED BIBLIOGRAPHY 1946-1955—World Health Organization. New York, N. Y.: Columbia University Press (2960 Broadway), 1958. 391 pp. Price, $6.75.

This annotated bibliography covers about 2,700 items in the field of medical education published between the years 1946 and 1955, inclusive. A brief annotation is given for those articles or monographs, the titles of which do not indicate the content or which are written in a foreign tongue. The contents are organized in chapters which deal with such aspects of medical education as subjects, teachers, students, social and financial aspects, curriculum, countries, etc. An author index is appended and cross-references are made where indicated.

INTERIM REPORT: HOUSING AND BUILDING REGULATIONS IN NEW YORK STATE TOWNS AND VILLAGES. Albany, N. Y.: State Division of Housing (270 Broadway), 1959. 66 pp.

The State of New York has been involved in the study of housing for many years. In 1958 a state building construction code was published in two parts. One part dealt with one and two family houses, the other with multiple family buildings. In July, 1958, a report on a study of the effectiveness of housing codes was published under the title, Housing Codes, the Key to Housing Conservation (see A.J.P.H. May, 1959, p. 702). In preparation of this report, it became apparent to the State Division of Housing that there was a definite need to survey thoroughly housing and building regulations in New York State towns and villages. There are 932 towns in New York State. These vary in size from seven square miles to 466 in area and in population from 85 persons to 685,176. Large and small, they are all subject to the rapid changes that are going on in all of our communities.

The Bureau of Community Development recognized in making the survey that one of the basic requirements for prevention and elimination of the blighting effects of rapid growth and change in our communities is the existence of adequate regulations. This report attempts to record the situation in the various towns of the state with regard to regulations having to do with housing. After giving a general description of the problem of urban sprawl the report goes on to discuss housing and building regulations that now exist in the various metropolitan and nonmetropolitan areas of the state. A limited number of copies of the report are available from the Bureau of Community Development, State Division of Housing, 270 Broadway, New York 7, N. Y.

INTERNATIONAL WORK IN BILHARZIASIS. 1948-1958—World Health Organization, Geneva, Switzerland. $.30, 1959.

Bilharziasis is estimated by WHO that it effects some 150 million people throughout the world. This brief 58-page report has been prepared to give background as to the extent of the disease, its cause and methods of control. Special discussion of the use of molluscides is included as well as a rather lengthy discussion of the control project being conducted in Leyte, the Philippines.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ADVENTURES OF THE MIND. From the Saturday Evening Post. Edited by Richard Truelsen and John Kobler. New York, N. Y.: Knopf, 1959. 285 pp. Price, $4.50.

AGING AND SOCIAL HEALTH IN THE UNITED STATES AND EUROPE. REPORT OF AN INTERNATIONAL SEMINAR, MERANO, ITALY, JULY 9-13, 1957. Ann Arbor, Mich.: Division of Gerontology, University of Michigan, 1959. 186 pp.

ALGAE IN WATER SUPPLIES. Public Health Service. U. S. Department of Health, Education, and Welfare. Washington, D. C.: Gov. Ptg. Office, 1959. 88 pp. Price, $1.00.

AMERICAN MARRIAGE AND DIVORCE. Paul H. Jacobson. New York, N. Y.: Rinehart, 1959. 188 pp. Price, $12.00.

CHRONIC ILLNESS IN A RURAL AREA. VOL. III. Ray E. Trussell and Jack Elinson. New York, N. Y.: Commonwealth Fund, 1959. 440 pp. Price, $7.50.

DIRECTORY OF THE MEDICAL LIBRARY ASSOCIATION (2nd ed.). Foreword by J. F. Fulton. Hamden, Conn.: Shoe String Press, 1959. 274 pp. Price, $7.00.

EDUCATION FOR CHILD REARING. Orville G. Brim, Jr. New York, N. Y.: Russell Sage Foundation, 1959. 362 pp. Price, $5.00.

EDUCATORS GUIDE TO FREE TAPES, SCRIPTS, AND TRANSCRIPTIONS, 1960 (6th ed.). W. A. Wittich and G. H. Halsted. Randolph, Wis.: Educators Progress Service, 1959. 225 pp. Price, $5.75.

EPIDEMIOLOGICAL BASIS OF TUBERCULOSIS ERADICATION IN DENMARK—A CONCURRENT COMPARISON OF HOME AND SANATORIUM TREATMENT OF PULMONARY TUBERCULOSIS IN SOUTH INDIA. WHO Bull., Vol. 21, No. 1, 1959. New York, N. Y.: Columbia University Press, 1959. 144 pp. Price, $2.00.

THE HEINZ HANDBOOK OF NUTRITION. New York, N. Y.: McGraw-Hill, Blakiston Division, 1959. 439 pp. Price, $5.75.

HUMAN NUTRITION AND DIETETICS. Sir S. Davidson; A. P. Meiklejohn; and R. Passmore. Baltimore, Md.: Williams and Wilkins, 1959. 844 pp. Price, $15.00.

JEWISH MEDICAL ETHICS. Immanuel Jakobovits. New York, N. Y.: Philosophical Library, 1959. 381 pp. Price, $6.00.

LABORATORY TESTS IN COMMON USE (2nd ed.). S. Garb. New York, N. Y.: Springer Publishing, 1959. 185 pp. Price, $2.50.

LIVING BEYOND YOUR HEART ATTACK. Eugene B. Mozes. New York, N. Y.: Prentice-Hall, 1959. 212 pp. Price, $3.50.

LIVING CONSCIOUSLY: THE SCIENCE OF SELF. J. M. Dorsey and W. H. Seegers. Detroit, Mich.: Wayne State University Press, 1959. 174 pp. Price, $4.95.

MATERIALS OF DEMOGRAPHY. A SELECTED AND ANNOTATED BIBLIOGRAPHY. Hope T. Eldridge. Providence, R. I.: Population Association of America, Brown University, 1959. 222 pp.

MEDICAL ASPECTS OF TRAFFIC ACCIDENTS—A SUMMARY OF A PANEL DISCUSSION. Toronto, Ontario, Canada: Canadian Highway Safety Conference, Epidemiology Division, Department of National Health and Welfare, 1959. 19 pp.

METHODS OF RADIOCHEMICAL ANALYSIS. REPORT OF A JOINT WHO-FAO EXPERT COMMITTEE. New York, N. Y.: Columbia University Press, 1959. 116 pp. Price, $1.00.

1,000 HOMOSEXUALS. Edmund Bergler. Paterson, N. J.: Pageant Books, 1959. 249 pp. Price, $4.95.

PLANNING HOMES FOR THE AGED. Geneva Mathiasen and Edward H. Noakes, Editors. New York, N. Y.: F. W. Dodge Corporation, 1959. 128 pp. Price, $12.75.

SMOKING, LUNG CANCER AND YOU. Robert N. C. McCurdy. New York, N. Y.: Robert M. McBride, 1959. 72 pp.

SOCIOLOGICAL THEORY AND MENTAL DISORDER. H. Warren Dunham. Detroit, Mich.: Wayne State University Press, 1959. 298 pp. Price, $5.50.

STREET CLEANING PRACTICE (2nd ed.). Street Sanitation Committee, American Public Works Association. Chicago, Ill.: Public Administration Service, 1959. 424 pp. Price, $7.00.

STUDY ON THE NONSEGREGATED HOSPITALIZATION OF ALCOHOLIC PATIENTS IN A GENERAL HOSPITAL. Mark Berke, et al. Chicago, Ill.: American Hospital Association, 1959. 50 pp. Price, $1.75.

SYMPOSIUM ON BASIC RESEARCH. Dael Wolfle, Editor. Washington, D. C.: American Association for the Advancement of Science, 1959. 328 pp. Price, $3.00; $2.50 to AAAS members.

SYMPOSIUM ON GLAUCOMA. William B. Clark. St. Louis, Mo.: Mosby, 1959. 314 pp. Price, $13.50.

WHERE SOMEBODY CARES. MARY MANNING WALSH HOME AND ITS PROGRAM. Mother M. Bernadette de Lourdes. New York, N. Y.: Putnam's, 1959. 252 pp. Price, $5.00.

VITAL STATISTICS OF THE UNITED STATES 1957. VOL. I. INTRODUCTION AND TEXT. Tables. Tables for Alaska, Hawaii, Puerto Rico, and Virgin Islands. Marriage, Divorce, Natality, Fetal Mortality and Infant Mortality Data. Halbert L. Dunn, M.D., Washington, D. C.: Gov. Ptg. Office, 1959. 396 pp. Price, $4.50.

THE VIRUSES. VOL. I. GENERAL VIROLOGY. F. M. Burnet and W. M. Stanley. New York, N. Y.: Academic Press, 1959. 609 pp. Price, $16.50.

VIRUS HUNTERS. Greer Williams. New York, N. Y.: Knopf, 1959. 503 pp. Price, $5.95.

WHO GOES TO GRADUATE SCHOOL? George L. Gropper and Robert Fitzpatrick. Pittsburgh, Pa.: American Institute for Research, 1959. 66 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

More About Fat—If you hold firm opinions in the matters of unsaturated and saturated fats in the diet, then these five papers certainly are for you. Even if your opinions haven't yet firmed up but your curiosity remains high, then you will still benefit from a reading of this symposium. The papers seem to be just about the nearest answer yet to the question—what is the significance of serum cholesterol levels?

AHRENS, E. H., JR., et al. Symposium on Significance of Lowered Cholesterol Levels. J.A.M.A. 170, 18:2198 (Aug. 29), 1959.

National Phenomenon—Here are some statistics for you: 35 million employees enjoy coffee breaks during which they drink eight billion cups of coffee a year. Rest periods are now legally required in some states—are called for in many collective bargaining agreements, and have survived testing in the courts. That they increase production, minimize absenteeism, lower accident frequency, and reduce fatigue all remain to be validated, though all seem quite generally to be accepted as gospel.

FELTON, J. S. The Coffee Break. Indust. Med. 28, 10:433 (Oct.), 1959.

Measuring Work—When budget-time rolls round hard looks are directed again at programs and performances. Then it is that decisions are made to "measure" work. As nursing often gets the lion's share of the budget and units of nursing service are pretty clearly established, it is the nurses who usually get measured. Here are two papers discussing what can be measured and what cannot. There is a lot in both papers that professionals other than nurses might profitably take to heart.

FERGUSON, M. Work Measurement and Performance Budgeting (and) KLUMP, O. M. The Application of Work Measurement and Performance Budgeting to Nursing. Nursing Outlook 7, 10:570 (Oct.), 1959.

On Health Expertise—The man-in-the-street assumes that everyone in public health must be a "health expert" and that expert advice must be on tap for the asking. Your particular man-in-the-street may have heard backstairs gossip about the cancer hazard of wax-lined milk containers. Is it true? he asks you. Here is your (official) answer, a statement by the secretary of HEW, ". . . the findings (of extensive research) are not final, but no indications of a health hazard have been found."

FLEMMING, A. S. Wax Used for Milk and Food Containers. Pub. Health Rep. 74, 9:831 (Sept.), 1959.

Personal Pulchritude Pointer—There are better reasons for wearing contact lenses than the one immortalized in Dorothy Parker's deathless lines, "men seldom make passes/at girls who wear glasses." Actually, several million men or women are now wearing contact lenses (successfully). So maybe you, too, will want to know the latest news about these modern improvements on spectacles. You will also get some information about the not inconsiderable ordeal of getting them fitted. Incidentally, there are other good articles in the issue that you will read when you've finished this one.

FONDA, D. A. Value of Contact Lenses. Sight-Saving Rev. 29, 3:135 (Fall), 1959.

Bent Twigs—A survey of school children's feet (in Scotland) found half the girls and about a third of the boys with some foot defect. Unsatisfactory, ill-fitted shoes were commonly worn. The county medical officer of health thereupon outlined a program to meet the clearly shown need for some sort of preventive, remedial, and educative effort.

FREEBAIRN, N. C., et al. A Foot Survey of Sterlingshire School Children. M. Officer 102, 13:155 (Sept. 25), 1959.

All Not Rosy—Those who are impatient about our native reluctance to take on a more general BCG vaccination plan as a feature of our tuberculosis program will do well to ponder over this discussion of complications following prophylactic treatment which begins: "It is known that BCG vaccination may be complicated by excessive reactions." Among vaccinated infants in the reported experience the incidence was 1.67 per cent.

GEMMILL, J. S. BCG Vaccination. M. Officer 102, 12:141 (Sept. 18), 1959.

A Matter of Money—Do you know the total, and per capita, amounts that your state and its towns are spending on health and hospitals? Well, here are your figures for 1957. Your state's relative standings should furnish much food for thought and maybe provide some telling statistics when questions of finances arise.

GOOCH, M. State and Local Government Expenditures for Health and Hospitals. Pub. Health Rep. 74, 9:833 (Sept.), 1959.

Removing Salt—As water resources diminish in relation to our ever-growing demand, the problem of converting sea water (of which we have a lot) to drinking water (of which we have too little) becomes increasingly of moment. This progress report, though a little technical for us laymen, is of interest. It looks now as though the cost of conversion may become less than a dollar per thousand gallons—a bargain, it would seem for arid areas.

HOWE, E. D. Progress in Saline Water Conversion. J. Am. Water Works A. 51, 10:1191 (Oct.), 1959.

Objections Refuted—This condensation of a report, "Water Fluoridation Practices in Major Cities of the U. S." answers the objections that, curiously enough, are raised in high places against fluoridating the water supplies of the few big cities that thus far have put off this major guardian of dental health. In fewest words, what smaller cities can do, the largest ones can do equally economically and efficiently.

INGRAM, W. T., and MOORE, G. W. Fluoridation in Major Cities of the United States. J. Am. Water Works A. 51, 9:1095 (Sept.), 1959.

All About TB—This really must be the latest word on tuberculosis. Six expert panels discuss (1) chemoprophylaxis, (2) hospital and home care, (3) problems of relapse, (4) case finding, (5) medical treatment, and (6) future control problems. The entire 169 pages of this reporting will surely be known to all who are immediately concerned with TB. The rest of us will also find the reading profitable.

MCDERMOTT, W., et al. International Symposium of the Deborah Sanatorium and Hospital. Am. Rev. Resp. Dis. 80, 4:1 (Part 2) (Oct.), 1959.

With Us Still—Plumbing cross-connections and backflow connections remain one of the chief causes of waterborne disease outbreaks. So it behooves us to know something about the principles and practices involved in this hazard, even though someone else may have the job of finding and correcting such dangerous installations. This officially sponsored statement is layman clear and concise. Better look it up!

MICHAEL, J. M. The Theory and Methods of Preventing Back-Siphonage and Cross Connections. Sanitarian 22, 1:31 (July-Aug.), 1959.

How Early? — "Placentally transmitted maternal (poliomyelitis) antibody had fallen to noninhibitory levels in almost all six-month-old infants and in all nine-month-old infants tested." Studies earlier reported upon show that one-week-old infants do not respond to three monthly doses of vaccine but that 16-week-old infants responded better, even though some maternal (type 1) antibody was evident.

PERKINS, F. T., et al. Responses of Six- and Nine-Month-Old Infants to Two and Three Doses of Poliomyelitis Vaccine. Brit. M. J. 5151:530 (Sept. 26), 1959.

More Polio Prophylaxis — This past year about 11 million children (in communist countries) received live-virus vaccine orally. The results are reported to be good in the vaccinated and those who became immune through contact infection. In the opinion of the author of this paper, public health authorities here should "take immediate steps to check the validity of the results of these immense field trials . . . before the 1960 poliomyelitis season."

SABIN, A. B. Status of Field Trials with an Orally Administered Attenuated Poliomyelitis Vaccine. J.A.M.A. 171, 7:863 (Oct. 17), 1959.

Export Health — Among several papers of unusual interest to American readers presented to this British Health Congress are three by members of our Association. Dr. Salk answers assertions that only live-virus vaccines will control poliomyelitis. Dr. Philip Drinker tells about Los Angeles automobile exhaust smog, and Professor Bond pictures our expanding traditional and modern environmental health practices. It is a rewarding experience to read about native matters couched in terms for foreign consumption.

SALK, J. E. Vaccination Against Poliomyelitis: An Ounce of Prevention (and two other United States presentations). Roy. Soc. Health J. 79, 4:310 (July-Aug.), 1959.

"Physician, Heal Thyself"—Smoking habits of physicians in one state, at least, have changed in the last five years. In 1954 only 34 per cent said they did not smoke; now 45 per cent say they abstain. Almost all (93 per cent) thought that teen-agers should be taught about the cancer hazard of cigarette smoking.

SNEGIREFF, L. S., and LOMBARD, O. M. Smoking Habits of Massachusetts Physicians. New England J. Med. 261, 12:603 (Sept. 17), 1959.

Is This News?—"The year 1959 has been outstanding in the development of occupational health programs in state

and local governments." Perhaps you should know that this seeming good news is somewhat relative, for occupational health activities in general have been grossly underdeveloped and even today the professional staffs are half the number needed to do even a halfway adequate job.

TRASKO, V. M., and YAFFE, C. D. Trends in Occupational Health Programs in State and Local Units. Pub. Health Rep. 74, 9:823 (Sept.), 1959.

Reminder—In years gone by this 40-year-old sheltered shop was often in the (public health and social work) news. But nowadays there may be readers who will never have heard of this place where the stabilized tuberculous, the cardiac, and the convalescing physiatric patient may work his way back to economic self-sufficiency through industrial rehabilitation.

ZALFAS, I. E., and SCHWARTZ, B. S. Rehabilitation Nursing in a Sheltered Workshop. Am. J. Nursing 59, 10:1428 (Oct.), 1959.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Avenue, New York 16, N. Y.
Am. Rev. Resp. Dis. (American Review of Respiratory Diseases), National Tuberculosis Association, 1790 Broadway, New York 19, N. Y.
Brit. M. J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London, W.C.1, England.
Indust. Med. (Industrial Medicine and Surgery), 605 N. Michigan Avenue, Chicago, Ill.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.
J. Am. Water Works A. (Journal of the American Water Works Association), 2 Park Ave., New York 16, N. Y.
M. Officer (Medical Officer), Chronicle House, 72-78 Fleet St., London, E.C.4, England.
New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.
Nursing Outlook, American Journal of Nursing Company, 2 Park Avenue, New York 16, N. Y.
Pub. Health Rep. (Public Health Reports), Gov. Ptg. Office, Washington, D. C.
Roy. Soc. Health J. (Royal Society for the Promotion of Health Journal), 90 Buckingham Palace Road, London, S.W.1, England.
Sanitarian (National Association of Sanitarians), University of Denver, UPC, Department of Sanitary Science, Denver 10, Colo.
Sight-Saving Rev. (Sight-Saving Review), National Society for the Prevention of Blindness, Inc., 1790 Broadway, New York 19, N. Y.

NEWS FROM THE FIELD

WHO News

Regional Committee Meetings

Africa:

"It is now possible to look forward to the eradication, in the not too distant future, of such scourges as yaws and leprosy," according to the annual report of Dr. F. J. C. Cambournac, director of WHO's Regional Office for Africa. His report, presented at the recent meeting of the Regional Committee for Africa, indicated great strides in the control of communicable diseases in Africa, south of the Sahara.

The malaria eradication program has encountered difficulties, however, because in many areas residual spraying does not stop transmission of the disease under tropical African conditions. A coordinated intercountry eradication campaign has been initiated to reach more than four million persons scattered over a vast area.

Also reported by the director were 117 WHO fellowships from the African area in the year ending June 30, 1959, in addition to expanded training of health personnel in nursing, sanitary engineering, and maternal and child health.

The Americas:

The Pan American Health Organization, WHO's Regional Office for the Americas, at its September meeting in Washington, reported that smallpox is still considered a major public health problem in the Western Hemisphere. Of 103,491 people reported infected from 15 countries in 10 years, 16,000 died of the disease. Although "the expenditures required for completion of the hemisphere-wide campaign to eradicate smallpox are relatively small when compared with the enormous costs of campaigns to eradicate other major diseases," the eradication campaign is moving at a "slower pace than was expected." PAHO notes, however, that most of the countries are producing smallpox vaccine and continuing their national campaigns against the disease.

PAHO also reported that total eradication of malaria has been achieved in Barbados, Chile, Martinique, Puerto Rico, and the United States mainland. However, "continent-wide eradication is hampered" by Anopheles mosquitoes becoming resistant to pest killers, "usually in areas where insecticides have been widely used in agriculture."

The report notes considerable progress in eliminating Aedes aegypti. This yellow fever mosquito has been stamped out in ten countries and three other areas of the hemisphere. "The problem is now limited to North America, and its final solution depends on Mexico and the United States."

The committee also adopted a resolution supporting an international health and medical research year, which has been forwarded to WHO's director general. The next meeting will be held in Havana in August, 1960, at the invitation of the Cuban government.

Europe:

Increased attention to rural health services was reported by Dr. Paul van de Calseyde, WHO's regional director for Europe, at the recent ninth session of the Regional Committee for Europe. Such services are of fundamental importance since a large proportion of the population in many countries live in rural areas—84 per cent in Yugoslavia and more than 75 per cent in Turkey, Morocco, Romania, and Bulgaria.

Environmental sanitation work during the year was concentrated on problems of waste disposal, particularly in relation to water pollution. Among other main

trends in the European program are prevention of mental disorders, extension of children's services, planning and organization of medical care for the aged.

Western Pacific:

Dr. I. C. Fang, director of WHO's Regional Office for the Western Pacific, also emphasizes the strong rural health programs in many countries even in the face of economic hardships, unsettled conditions, and shortage of personnel.

Dr. Fang's report, presented to the tenth session of the Regional Committee, describes a trial project for the control of bilharziasis in the Philippines. Four health projects have been satisfactorily completed: yaws control in Laos, nursing education in Japan and Malaya, a midwifery project in the Philippines, and an exchange program between the London School of Tropical Medicine and the University of Malaya.

Dr. Fang warned the area governments of "too much reliance on foreign aid" which "may lead to the development of programs which the countries can hardly hope to continue." In some countries, also, lack of personnel "is serious enough to threaten the success of such vast undertakings as malaria eradication."

Exploring Cancer and Mental Health

WHO Chronicle reports that a WHO Expert Committee on Cancer met in Geneva June 22-27 to study "classification and nomenclature of primary tumours of various tissues of mesenchymal origin such as fibrous tissue, muscle tissue, fat tissue, vascular tissue, etc., grouped under the arbitrary designation of 'soft-tissue tumours.'" The committee also discussed the working principles and program for the international reference center for soft-tissue tumors located at the Armed Forces Institute of Pathology, Washington, D. C. The committee will issue a report.

WHO, in cooperation with the Finnish government, held a European Conference on Mental Health from June 24 to July 3, 1959, in Helsinki. Some 60 representatives of the professions of public health administration, psychiatry, pediatrics, nursing, and general medicine from 26 European countries attended. On the agenda were discussions of: preventive mental health work with children and the aged; professional training in mental health for nurses and doctors; health education aspects of mental health; administration (i.e., the best means of pursuing mental health activities within the framework of existing services).

U. S. Gives $6 Million to WHO Work

The United States has made special voluntary contributions of $3 million to the Malaria Eradication Special Account of the World Health Organization and $2 million to the Pan American Health Organization's malaria eradication campaign in the Americas.

Leroy E. Burney, M.D., Surgeon General, USPHS, chief United States representative to the Directing Council of the Pan American Health Organization, announced the gift at the 11th annual meeting of the council in Washington in October.

In addition, the United States will give $500,000 for expansion of WHO's medical research program; $300,000 for WHO's program for improvement of water supplies throughout the world; and an additional $200,000 to the Pan American Health Organization for improvement of water supplies in the Western Hemisphere.

Arthur S. Flemming, U. S. Secretary of Health, Education, and Welfare, presented checks for the $3 million and $2 million, respectively, to M. G. Candau, M.D., director-general, WHO, and Abraham Horwitz, M.D., director, WHO Regional Office for the Americas, at a special international dinner at the 87th

Annual Meeting of the American Public Health Association in Atlantic City, October 20. The dinner was co-sponsored by the APHA, the National Citizens Committee for World Health Organization, and the National Tuberculosis Association.

From Our Southern Border

The United States-Mexico Border Public Health Association has an interim president, Frank J. Von Zuben, Jr., chief, General Sanitation Services, Texas State Health Department, succeeding Henry A. Holle, M.D., who resigned upon leaving Texas where he formerly served as the state health officer. Association by-laws call for the vice-president from the same country as the retiring president to assume the presidency for the unexpired term. President-elect Dr. Adan Mercado Cerda, chief, Public Health and Welfare, State of Tamaulipas, will assume office at the 18th annual meeting, April 4-8, 1960, to be held in Hermosillo, State of Sonora.

Elsewhere on the border, the nursing staffs of the official health agencies in Laredo, Tex., and Nuevo Laredo, Mexico, plan to meet monthly, alternating between the two cities. The first of these bilingual meetings, held in July, was devoted to the maternity program of the health center on the Mexican side.

Subsidy to Correct Dental Defects

Trustees of the welfare fund, Office Employees International Union, Local 153, AFL-CIO, have recently subsidized a plan, pledging $150,000 for a one-year period, to correct the dental defects of union members working in seven New York City firms. This subsidy is in addition to the regular dental care insurance provided by the workers' employers. Group Health Dental Insurance, Inc., of New York (GHDI), the voluntary prepayment organization underwriting the plan, considers that, with this benefit, the 3,000 union members' coverage is the "nation's broadest dental insurance. . . . Practically any service needed . . . is included . . . such as fillings, extractions, dentures, bridges, and porcelain jack crowns."

GHDI characterizes the use of welfare fund reserves for this purpose as a "milestone." Dental insurance has in the past differed from hospital and medical in that people must correct their dental defects at their own expense before enjoying broad maintenance benefits. "Dentistry is partly elective and people tend to pile up defects and expense. . . . Welfare funds or employers having expendable reserves and imbued with a wish to help their members or employees achieve dental health may enable (beneficiaries) to put their mouths in top condition without incurring heavy expenses or debt."

25th New England Health Institute

"Changing Times and the Challenge to Health" was the theme of the 25th New England Health Institute which was held at Providence College June 17 and 18. Jeremiah A. Dailey, M.D., director of Rhode Island's State Department of Health, was host to the 481 delegates representing the six New England States as well as the District of Columbia, Florida, Georgia, New York, Pennsylvania, and Virginia.

Topics discussed at the general sessions varied from "Preface to Life" and "Exploring the Baby's World" to "Meeting the Challenge of Maturity" and included "Life Begins Again for the Chronically Ill."

Discussions at sessions of the Laboratory and Environmental Sanitation Sections focused on "Use of Fluorescent Antibody Techniques in Diagnostic Procedures," "Radiation Exposure—A Challenge to Public Health," and "Synthetic Detergents in Well Water."

At the banquet, Professor William M. Stewart, director, Sales Division, Northeastern University, provided a relaxing change of pace with his presentation of "Your Only Problem Is People."

During the final conference, the institute outlined its plans for the beginning of a new quarter century in its history. Albert L. Chapman, M.D., Assistant Surgeon General, USPHS, brought the 25th meeting to a close with a message on the "Springboard for the Future."

The 1960 meeting of the institute will be held in Vermont.

Reexamine the Sources of Talent

Seventy-five persons from 50 national agencies and professional groups attended the Second Conference on Recruitment sponsored by the Commission on Health Careers of the National Health Council, October 1-2, in New York City.

Alvin C. Eurich, Ed.D., chairman of the commission and vice-president, Fund for the Advancement of Education, spoke of the importance of using more trained auxiliary personnel to conserve professional workers' time and energy. "We need to reexamine the tasks which can be done by the employment of paid or voluntary workers with the necessary interest, dedication, and abilities."

Calling for more creative tapping of the sources of ability and brains in our country, John D. Porterfield, M.D., Deputy Surgeon General, USPHS, expressed disbelief that we have a "shallow national reservoir of talent." There are "sizable young populations with a substantial prevalence of mental capacity which have probably been exposed very lightly, if at all, to a career case-finding program."

The problems, needs, and use of guidance counselors received special attention during the meeting. Guidance personnel from the field assisted in the training aspects of the conference. James G. Stone, executive secretary, National Tuberculosis Association, was chairman. NHC reports that 21 state-wide health careers committees are active.

Francis B. Elder, engineering associate, APHA, represented the Association at the conference.

The Health Education Structure

The organization of health education within the structure of the national voluntary health agency was discussed at the National Health Council's Third Clinic on Health Education Problems, attended by 46 representatives of national agencies. The clinic was held in Princeton on September 15, 16, and 17, 1959.

The question for discussion was "Can the administrative structure of a health agency be so organized as to get optimum response in its efforts to motivate people to action?" Following the keynote address by Edward A. Suchman, Ph.D., director of social science activities, New York City Department of Health, two days were given up to group discussions.

Theron H. Butterworth, Ph.D., health education consultant, National Society for Crippled Children and Adults, reported some of the preliminary findings of a "Study of Organization for Health Education in National Health Agencies," being carried on by the Health Education Committee of the National Health Council.

A report of proceedings will later be available to member agencies of the National Health Council.

Horace H. Hughes, Maternity Center Association, was chairman of the clinic; Harold N. Weiner, director of the National Publicity Council for Health and Welfare, was the reporter. He is preparing a report of the proceedings for circulation to member agencies of the National Health Council.

Schizophrenia Agency Formed

RISE, Inc. (Research in Schizophrenia Endowment) founded in September, is the first voluntary agency whose sole purpose is to advance research into the cause, treatment, prevention, and cure "of this illness responsible for more than half of the patients in all mental hospitals."

To advance its objectives RISE will support the training of personnel in schizophrenia research, foster exchanges of information with researchers in related fields and "conduct an intensive public education campaign." RISE will solicit public support starting in December to increase its financial resources. At time of founding these included a $25,000 grant from the Rockefeller Brothers Fund and the assets of the Psychiatric Research Fund which has merged with RISE.

Mrs. Godfrey S. Rockefeller is president. Other officers are vice-presidents, Stanley R. Dean, M.D., Stamford (Conn.); Paul H. Hoch, M.D., New York state commisioner of mental hygiene (Albany); secretary, Austin M. Davies, executive assistant, American Psychiatric Association; treasurer, Godfrey S. Rockefeller, Greenwich (Conn.). David M. Rioch, M.D., director, Division of Neuropsychiatry, Walter Reed Army Institute of Research, heads the agency's Scientific Council. Executive director is John I. Roney. RISE offices are at 9 Rockefeller Plaza, New York City.

Philadelphia Endorses New Method

The Philadelphia Department of Public Health so strongly supports the recently developed "mouth-to-mouth" or "mouth-to-nose" method of artificial respiration that it is actively campaigning to introduce the new method to all the people of Philadelphia. The health department's mimeographed "Plan of Action for Public and Professional Education in the use of Expired Air Resuscitation Technique" describes its program and suggests ways for stimulating community groups to the discussion of the new technic. The health department reports that the Philadelphia Society of Anesthesiologists has given "outstanding" support in this activity. John J. Hanlon, M.D., is director of public health services of the Philadelphia agency. An informative leaflet and "wallet card check-list" have been published.

Dental Public Health Examinations

The American Board of Dental Public Health will hold its next certifying examination on October 13 and 14, 1960, in Los Angeles, Calif., in conjunction with the annual meeting of the American Dental Association. Candidates for this examination must submit their applications not later than June 15, 1960. Information and application forms may be obtained from the secretary, Donald J. Galagan, D.D.S., Division of Dental Public Health, USPHS, Washington, D. C.

Officers elected during the recent meeting of the board are:

President—Robert A. Downs, D.D.S., chief, Public Health Dentistry Section, Colorado State Board of Public Health, Denver

Vice-President, Auditor—Chester V. Tossy, D.D.S., Michigan Department of Health, Lansing

Secretary-Treasurer—Donald J. Galagan, D.D.S., M.P.H., assistant chief, Division of Dental Public Health, Public Health Service, Washington.

PERSONALS

David B. Ast, D.D.S., M.P.H.,* director, New York State Bureau of Dental Health, was recently elected president, American Association of Public Health Dentists.

William W. Belford, M.D.,* San Diego, Calif., has assumed office as the 30th president of the American Academy of Pediatrics.

DeWitte T. Boyd, M.D., M.P.H.,† former medical director, Los Angeles City Health Department, is now Kern County, Calif.,

* Fellow.
† Member.

health officer, succeeding WILLIAM C. BUSS, M.D.,* who has resigned because of ill-health.

TOM BRUNY, former business manager, Wyoming State Hospital at Evanston, has been appointed director, Division of Hospital and Medical Facilities, Wyoming State Health Department.

MANUEL COHEN,* former executive director, Jewish Hospital of Hope, Montreal, is now administrator, Mount Sinai Hospital, Milwaukee, Wis.

J. T. ELLIS, JR., former administrative assistant to GOVERNOR PRICE DANIEL in the field of fiscal affairs and water development, has been named general business and central administration officer, Texas State Health Department.

A. CARLTON ERNSTENE, M.D., Medical Division chairman of the Cleveland Clinic, is the new president, American Heart Association. PAUL OGLESBY, M.D., clinical associate professor of medicine, University of Illinois College of Medicine, is president-elect.

LIEUTENANT COLONEL OSCAR FELSENFELD, MC, USA,* epidemiologist, Division of Preventive Medicine, Walter Reed Army Institute of Research, has received the Commendation Ribbon with Metal Pendant "for his ability to organize and coordinate the work without loss of time, and to work and lead others in a turbulent, changing environment," while on service with the U. S. Army Medical Service Team in Thailand.

JOSEPH FENTON, Ed.D., former associate, Bureau for Handicapped Children, New York State Education Department, has been named special assistant for rehabilitation to the executive director, New York State Interdepartmental Health Resources Board.

DELPHIE FREDLUND,† formerly with the Family Nursing Service of Minneapolis, has been appointed instructor in public health nursing, University of Minnesota School of Public Health.

RUTH BENSON FREEMAN, Ed.D.,* is on a one-year leave from Johns Hopkins University, where she is associate professor, public health administration, to be consultant to the Medical and Natural Sciences Program of the Rockefeller Foundation.

LILLIAN A. GARDINER, R.N.,* Senior Nurse Officer, PHS, has retired.

J. C. GEIGER, M.D.,* has received the Regular Veterans Association's Distinguished and Meritorious Service Ribbon and Gold Star "For valuable medical and public health assistance rendered specifically to veterans, over the many years."

HENRY M. GELFAND, M.D.,† formerly professor of epidemiology, Tulane University Medical School, is now chief, Enterovirus Unit, Laboratory Branch, PHS, Communicable Disease Center.

THOMAS L. HAGAN, D.D.S., M.P.H.,* chief, Division of Dental Public Health, PHS, has retired.

WILLIAM T. HALL, former social worker, Wyoming State Health Department, is now instructor in maternal and child health, University of Minnesota School of Public Health.

FAY M. HEMPHILL, Ph.D.,* former associate professor, University of Michigan School of Public Health, is now chief, Statistics and Analysis Branch, Division of Research Grants, National Institutes of Health, Bethesda, Md.

GLEN J. HOPKINS, M.P.H.,* regional engineer, Kansas City Regional Office, PHS, is on a three-month assignment as consultant to the Jordan national government in its water program. He will work under the auspices of the International Cooperation Administration.

ROSEMARY JOHNSON,† has been promoted from instructor to assistant professor of public health nursing, Arizona State University, Tucson, Ariz.

HENRY W. KASSELL, M.D.,* former medical consultant, Denver Regional Office, PHS, Bureau of Indian Affairs, has been assigned to the Wyoming State Health Department as acting director of public health during the educational leave of newly appointed JAMES W. SAMPSON, M.D.†

SELIG H. KATZ, M.D., M.P.H.,† former deputy state and county health officer, Calvert County (Md.), has been appointed assistant director for maternity and newborn services, Bureau of Maternal and Child Health, New York State Health Department.

JAMES H. LADE, M.D.,* director of medical defense, New York State Health Department, has been appointed special assistant to the state health commissioner, with responsibility for coordinating all work in the department concerned with radiological health.

ANNE M. MCQUADE, R.N.,† formerly of the Department of Nursing, Faculty of Medicine, Columbia University, New York City, has been appointed mental health nurse consultant, Visiting Nurse Service of New York.

* Fellow.
† Member.

A. Erin Merkel, M.D., M.P.H.,* former director, Jacksonville County Health Department (Ore.), is the new chief, Bureau of Maternal and Child Health, San Diego Health Department, succeeding Olive B. Cordua, M.D., who has retired.

Colonel Bennie A. Moxness,* MC, USAF (Rtd.), is now chief, Examiner Training and Control Branch, Office of the Civil Air Surgeon, Federal Aviation Agency.

Charles L. Newberry, M.D.,* PHS officer, assigned as health officer, Washington County, Hillsboro, Ore., has retired.

Cedric Northrop, M.D.,† has resigned as Washington State tuberculosis control officer to assume new duties as TB control officer for the Seattle-King County Health Department, succeeding the late John Fountain, M.D.

Jack Edward Pickering, M.D., epidemic intelligence service officer, PHS, is presently assigned as epidemiologist, Division of Communicable Diseases, Massachusetts Department of Public Health.

Edward R. Pinckney, M.D., M.P.H.,* former director, Comprehensive Clinic, Northwestern University Medical School, will serve as executive director, College of Medical Evangelists' new audiovisual postgraduate extension courses in medicine. He continues as editor of "The New Physician."

Daniel Powers,* former assistant director, Barnert Memorial Hospital, Paterson, N. J., has been appointed administrator, Long Beach Memorial Hospital, N. Y.

H. McLeod Riggins, M.D.,† associate clinical professor of medicine, College of Physicians and Surgeons, Columbia University, has been appointed president, National Tuberculosis Association.

Raymond W. Sarber, formerly of the Research Division, Parke, Davis and Co., is the executive secretary of the Society of American Bacteriologists, which has just opened national headquarters offices at 19875 Mack Ave., Detroit.

Cecil G. Sheps, M.D., M.P.H.,* now director, Beth Israel Hospital, Boston, and clinical professor of preventive medicine, Harvard Medical School, will become professor of medical and hospital administration, University of Pittsburgh Graduate School of Public Health early in 1960.

Joseph B. Stocklen, M.D.,* a member of the Board of Directors of the National Tuberculosis Association and former tuberculosis controller of Cuyahoga County, Ohio, has been appointed to the new position of chronic disease coordinator for Cuyahoga County.

Estella Ford Warner, M.D.,* retired public health service officer, is serving as a lecturer in maternal and child health during the fall quarter of the academic year, 1959-1960, University of Minnesota School of Public Health.

George M. Wheatley, M.D., M.P.H.,* New York, N. Y., director, Health and Welfare Division, Metropolitan Life Insurance Company, has been elected vice-president, American Academy of Pediatrics.

Edwin G. Williams, M.D., D.T.M.,† PHS officer, assigned to the Florida State Board of Health, has retired.

Julius L. Wilson, M.D.,† is now full-time director of medical education, National Tuberculosis Association, and its Medical Section, the American Trudeau Society. As director, Henry Phipps Institute for the Study and Prevention of Tuberculosis, University of Pennsylvania, he had served part-time with NTA for six years.

Lieutenant Colonel William J. Wilson, MC,† former chief, Environmental Hygiene Branch, Preventive Medicine Division, is now assistant chief of that division, and chief, Civil Public Health Branch, Army Surgeon General's Office.

DEATHS

Rufine Abriol, M.D., Dr.P.H.,† of Diliman, Quezon City, Philippines (Epidemiology Section).

William R. Berry,* supervisor, Bureau of Shellfish Sanitation, Division of Engineering, State Health Department, Richmond, Va. (Engineering Section).

Floyd H. Eggert, M.S.,* formerly associate virologist, Virology Department, Dr. Salisbury Laboratory, Charles City, Iowa, on May 1 (Laboratory Section).

William J. French, M.D.,* formerly deputy state and county health officer, Anne Arundel County Health Department, Annapolis, Md., in 1958 (Public Health Education Section).

Arthur B. Haw, M.S.,† of Ottumwa, Iowa, on August 21 (Laboratory Section).

Ray Clarence Mork,* assistant to the area medical administrator of the UMWA Welfare and Retirement Fund, Birmingham, Ala., on September 1 (Medical Care Section).

Philip J. Rafle, M.D., M.P.H.,* Suffolk County, N. Y., health commissioner on October 13 (Epidemiology Section).

* Fellow.
† Member.

CONFERENCES AND DATES

American Public Health Association, Eighty-Eighth Annual Meeting, San Francisco, Calif. October 31–November 4.

State and Regional Public Health Meetings—December, 1959, and January and February, 1960:

Mississippi Public Health Association. Robert E. Lee Hotel, Jackson. December 2–4.

Texas Public Health Association. Buccaneer Hotel, Galveston. February 21–24.

Meetings of Other Organizations:

American Diabetes Association. Eighth Postgraduate Course and 1959–1960 Interim Council Meeting. Los Angeles, Calif. January 20–24.

American Medical Association. Clinical Meeting. Dallas, Tex. December 1–4.

Council on Social Work Education. Oklahoma City, Okla. January 27–30.

National Dairy Council. La Salle Hotel, Chicago, Ill. January 25–27.

National Social Welfare Assembly. New York, N. Y. December 8–10.

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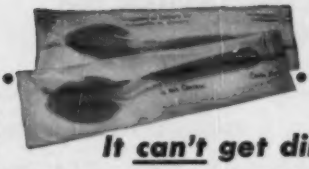

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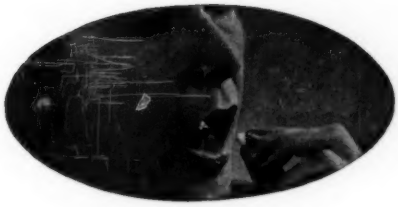

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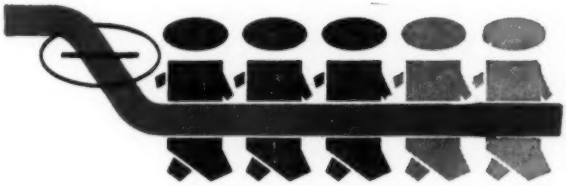

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